



User Guide for Vortex 851R printer (R13)

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Contents

Copyright statement.....	2
1. Introduction	7
1.1. Introduction to Memjet [®] print technology.....	7
2. Printer parts and their functions.....	9
2.1. Printer.....	9
2.2. Print engine.....	9
2.3. Printhead.....	9
2.4. Printhead Cartridge Dock	9
2.5. Print Mechanism	10
2.6. Cutter.....	10
2.7. Ink Cartridges.....	11
2.8. Ink Connection Ports	13
2.9. Ink Delivery System (IDS)	13
2.10. Bulkhead Assembly	13
2.10. Maintenance Module	15
2.12.1. Wiper station	17
2.12.2. Printing platen.....	17
2.12.3. Capping/spittoon station.....	18
2.12.4. Printhead servicing events.....	18
2.13. Print Zone.....	18
2.14. Onboard Print Engine Controller (OmniPEC) and Main Board	18
2.15. The Control System.....	19
3. Installing the Printer.....	20
3.1. Choose a location.....	20
3.2. Unpacking and Setup	20
3.3. Checking the contents	20
3.4. Connecting the Vortex 851R	21
3.5. Setting up the Printer	23
3.5.1 Maintenance Module (MM)	23
3.5.2 Installing Ink Cartridges	25
3.5.3. Installing the Printhead	26
3.5.5. Media Handling	32
3.6. Connect the printer to a computer	33

3.6.1. Direct connection to a personal computer.....	33
3.7. Installing the Printer Driver	34
3.7.1. Driver Specifications – Printer Preferences.....	42
3.8. Label printing, generating print jobs.....	46
3.8.1. Printing labels from softwares.....	46
3.8.2. Printing labels from print jobs.....	46
3.9.0. Printers Buttons.....	47
3.9.1. Buttons and Led signals	48
4. Toolbox	49
4.1. User Interface.....	49
4.2. Diagnostics.....	50
4.3. Ink Usage.....	52
4.4. Network configuration	53
4.5. Service Menus.....	54
5. Maintenance Guide	55
5.1. Maintenance Overview.....	55
5.2. Standard Maintenance	55
5.2.1. Daily Maintenance Tasks.....	57
5.2.2. Bi-Weekly Maintenance Tasks.....	59
5.2.3. Monthly Maintenance Tasks.....	62
5.2.4. Annual Maintenance Tasks.....	68
5.2.5. As Needed Maintenance Tasks	77
6. Troubleshooting	88
6.1. Maintenance Module (aka Service Station) Troubleshooting	88
6.2. Printhead Troubleshooting	89
6.3. Print quality problems.....	89
6.4. Vortex 851R Troubleshooting Guide	90
GENERAL	90
Documents to read before (available on ftp).....	90
Checklist before doing any support.....	90
Troubleshooting Tools	91
Installing and checking the Custom Firmware routines.....	91
Dead engine,EWS,Firmware	93
How to detect:.....	93

How to detect:.....	93
How to fix:	93
How to detect:.....	93
How to fix:	93
PRINT ENGINE: ERROR MESSAGES	94
Crit 63 03-phead offline cancelpage	94
CARTRIDGE_MISSING_X	94
DATA_PATH_UNDERRUN	94
Fatal 71 02 offline cancelpage.....	95
How to detect:.....	95
How to fix:	95
How to fix:	95
Explanation:	95
How to detect:.....	96
How to fix:	96
How to detect:.....	96
How to fix:	96
MAINTENANCE_BUSY	97
How to detect:.....	97
How to fix:	97
How to detect:.....	97
How to fix:	98
PAPERPATH_CUTTER_ERROR	98
PAPERPATH_FEED_TIMEOUT	98
PAPERPATH_PAPERJAM.....	98
6.5. Print Quality Issues	99
Color Mixing (CM).....	99
Examples for Color Mixing	100
Streaking (SR)	109
Dot Misplacement (DP).....	115
Banding (BD).....	118
Other General Print Quality Errors (GE).....	124
Paper Handling (PA)	133
Ink Delivery System (ID).....	138

Paper Cutting (PC)	140
Firmware Error Messages (ER)	141
Maintenance Module (MM)	143
7. Printer Specifications	144

1. Introduction

The purpose of this manual is to describe the operation of the Vortex 851R label printer. The first section provides an overview of the Memjet™ print technology to make you familiar with the terms and basics of this new technology that forms the basis of the Vortex 851R printer series. The following sections walk you through the installation steps, explain the components of the printer and their roles, and then teach you how to operate your printer. The manual ends with a maintenance and troubleshooting guide.

1.1. Introduction to Memjet[®] print technology

Memjet™ Technology is a revolutionary printing technology developed by Silverbrooks Research (Sidney, Australia). The core of this technology is a full paper width printhead capable of printing the entire page width at the same time without head movement. The result of this setup is a breakthrough 12 inch (305 mm) per second printing speed. The printhead is manufactured with state-of-the-art semiconductor technology; an A4 head contains 70,400 nozzles delivering 1600 dpi native resolution at full colour. The nozzles are arranged in 10 rows having 2 rows for each ink channels. The fixed head spans the width of the label and feeds an entire label at a time similar to a laser printer. This architecture dramatically improves performance and ink drop placement accuracy during printing, while decreasing noise and vibration.

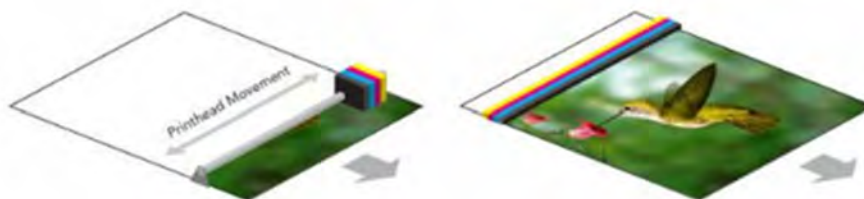


Figure 1 Printing with a traditional moving head and with the Memjet printhead.

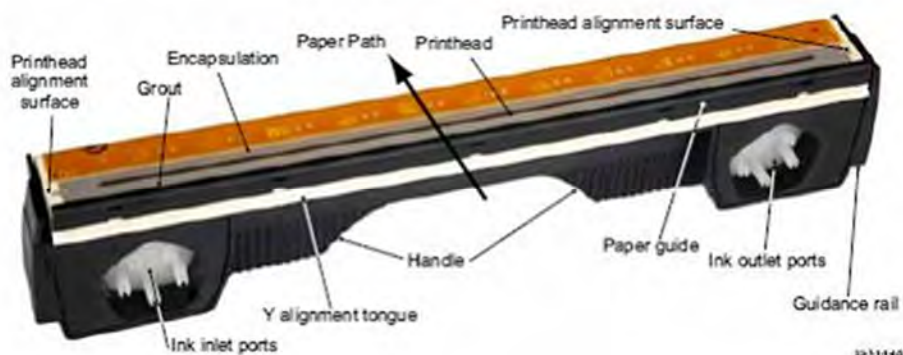


Figure 2 The Memjet 8.5" printhead cartridge showing the ink inlet, outlet ports, various print-related parts and the printhead.

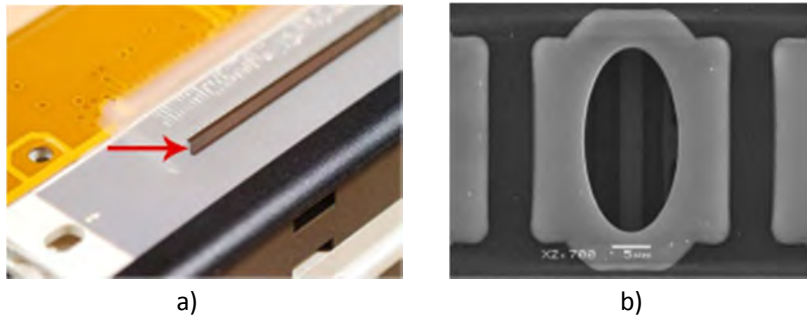


Figure 3 The Memjet printhead contains 70,400 nozzles in 10 rows (brown stripe in Figure a). An electron microscope image of a single nozzle (Figure b).

The small size of the nozzles **results in very small (1-2 picolitre)** paint drops, approximately 14 micron drop diameter on paper, effectively achieving the highest print resolution the human eye can see.

Printing with this type of precision requires many technical details to be solved including printhead cooling, using special fast drying inks, feeding paper accurately, controlling the operation of the unit, etc. A unique property of Memjet printing is the special print processor that uses a custom hardware print pipeline processing engine to render images at a very high speed. The level of technical standards are reflected by the fact that Silverbrooks Research hold 2500 patents related to Memjet Technology along with another 2000 pending.

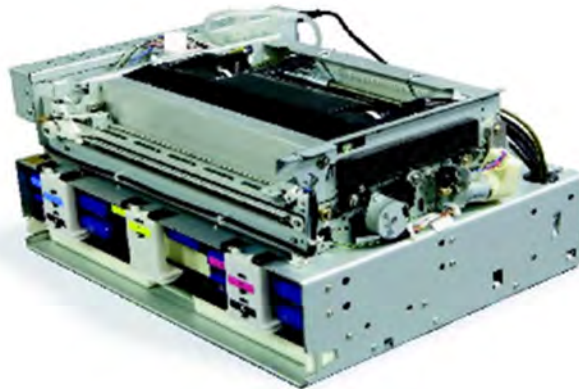
2. Printer parts and their functions

2.1. Printer

The Vortex 851R printer is a state of the art Memjet printer designed for maximum usability and performance. The major components of the printer are the print engine, the controller and the control panel.

2.2. Print engine

The print engine is the heart of the Vortex 851R printer. It is responsible for the actual print process. The major subsystems of the engine are the mechanics (paper transport), ink delivery system (including print head and ink tanks), the print controller and a paper cutter. The Vortex 851R controller is responsible to control the operation for the print engine. You do not need to access and use the print engine directly except when changing print heads and ink tanks.



Picture of the Print Engine

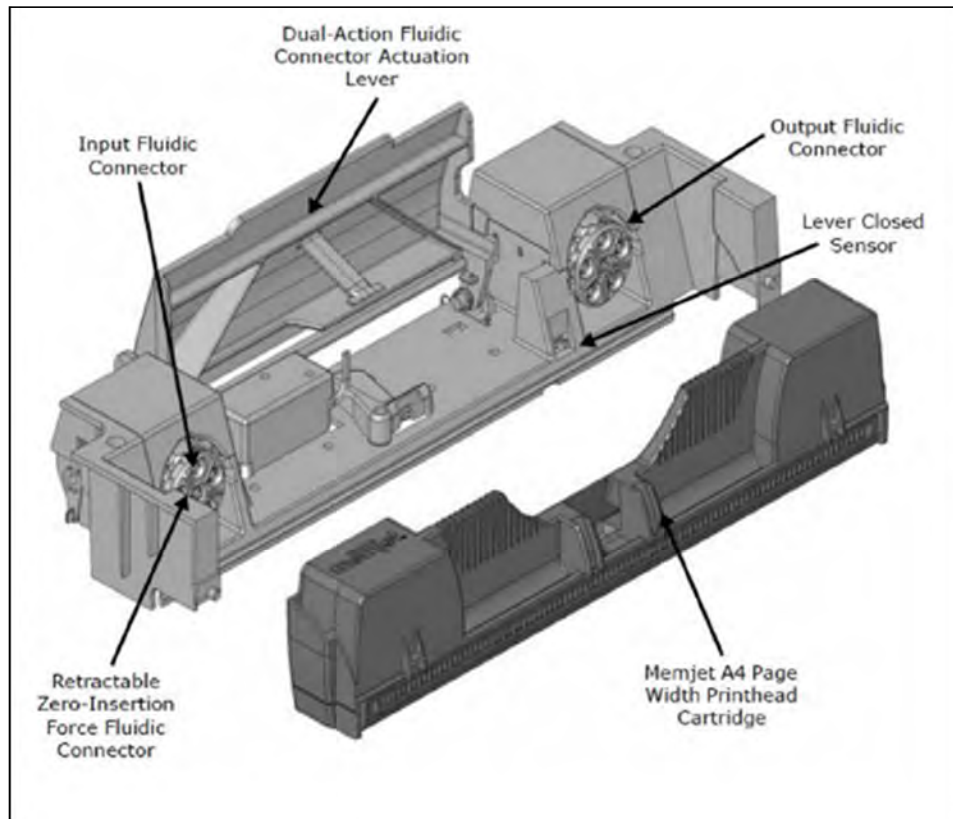
2.3. Printhead



Picture of the Printhead

2.4. Printhead Cartridge Dock

The printhead cartridge dock positions the page-wide, static, high-speed Memjet printhead in the correct location to maintain correct position with the print zone.



Picture of Fluidic Connectors and Memjet Printhead Cartridge

2.5. Print Mechanism

During printing, the print mechanism moves the paper through the print zone below the static printhead.

2.6. Cutter

The NorthStar cutter is designed to provide a complete cut of continuous media in the crossweb direction. This will provide the ability to singulate labels and enable a break in continuous media to allow servicing of the printhead.

The cutter has a design target of providing a 400,000 cut life on thin tag media. Cuts are expected to execute in 0.4 seconds at up to 80 8.5inch cuts/minute.

The cutter unit can be removed or replaced, if necessary, without affecting the performance of the NorthStar.

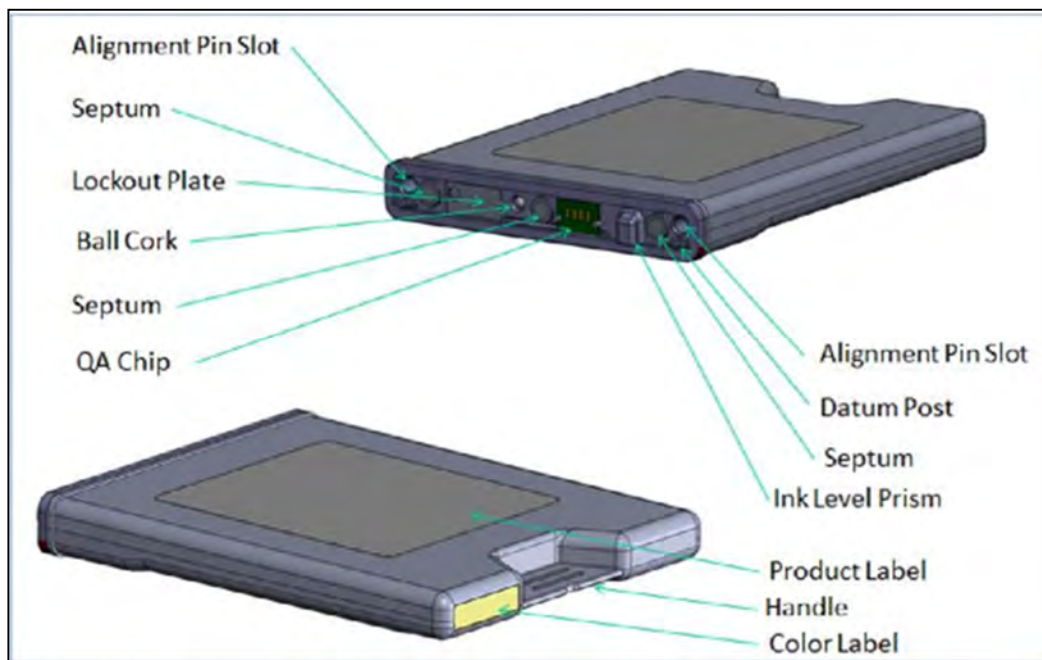


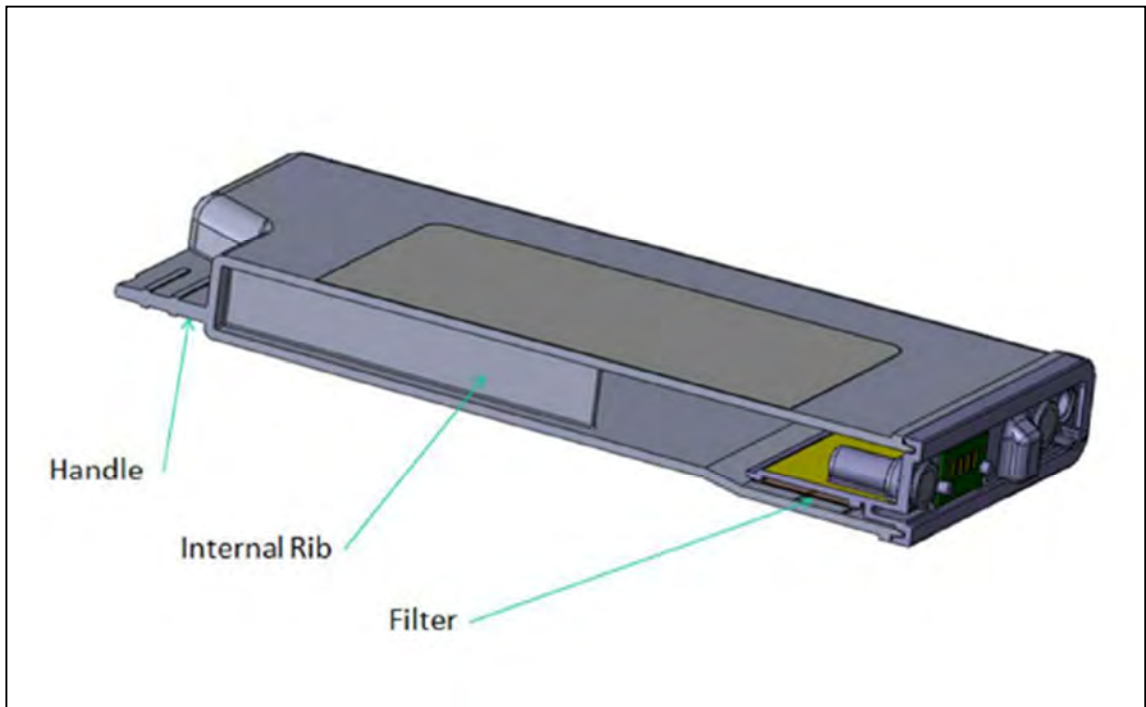
2.7. Ink Cartridges

Vortex 851R Series Printers use a single Printhead Cartridge and five Ink Tanks (two Black, one Cyan, one Magenta, and one Yellow). During installing the ink cartridges the Printer should be turned off.

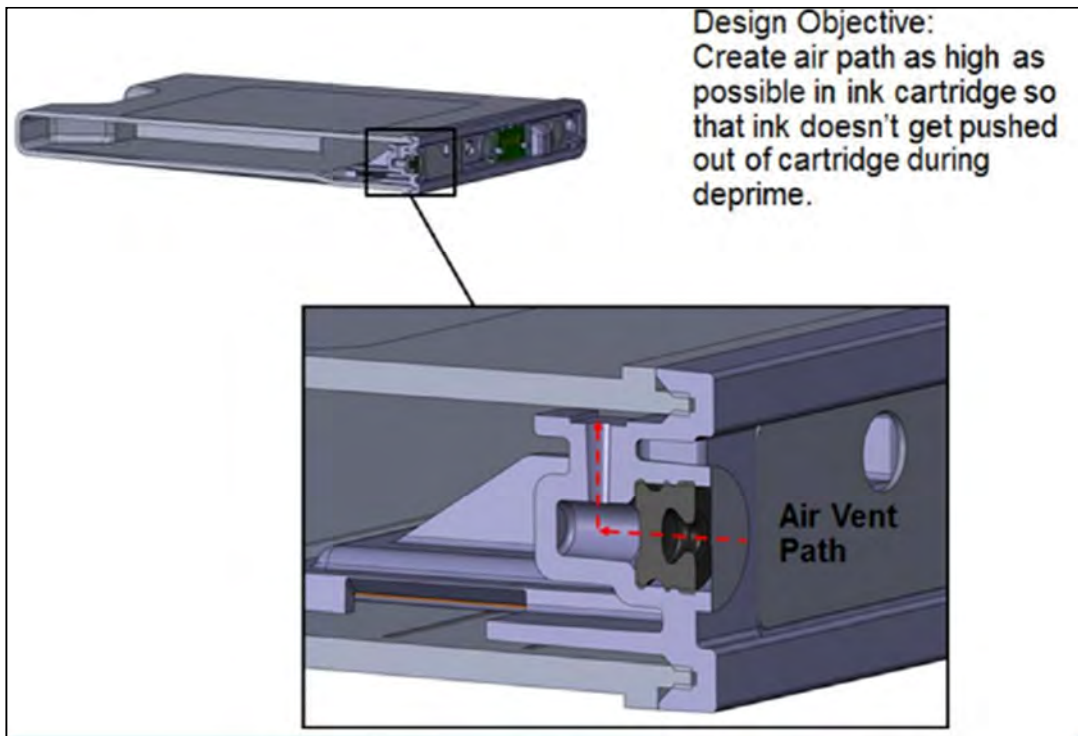


Picture of the ink cartridge





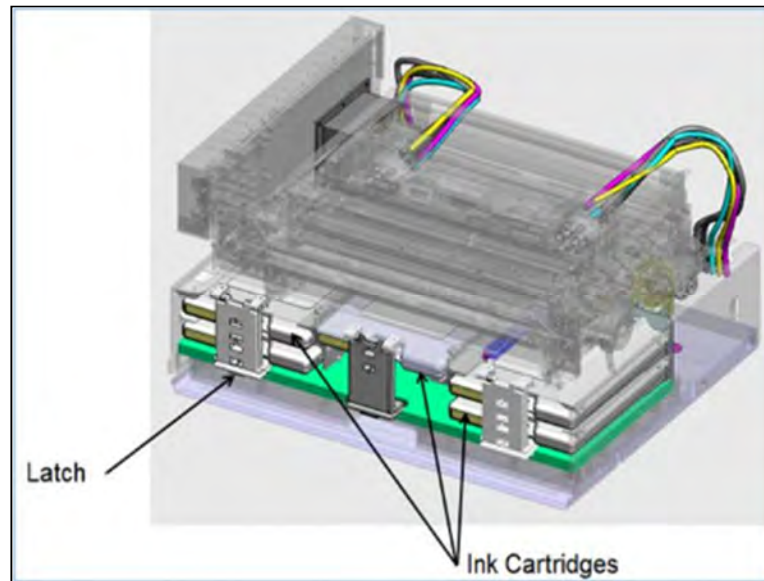
Picture of Ink Cartridge Cross-Section



Picture of Ink Cartridge Cross-Section with Air Vent Path Detail

2.8. Ink Connection Ports

Ink connection ports allow the connection of the external ink supply houses to the print engine. Unique, zero insertion-force, ganged connectors allow all 10 ink hoses to be engaged with the printhead in one movement. The printhead can be removed or installed without disconnecting any of the ink hoses.



2.9. Ink Delivery System (IDS)

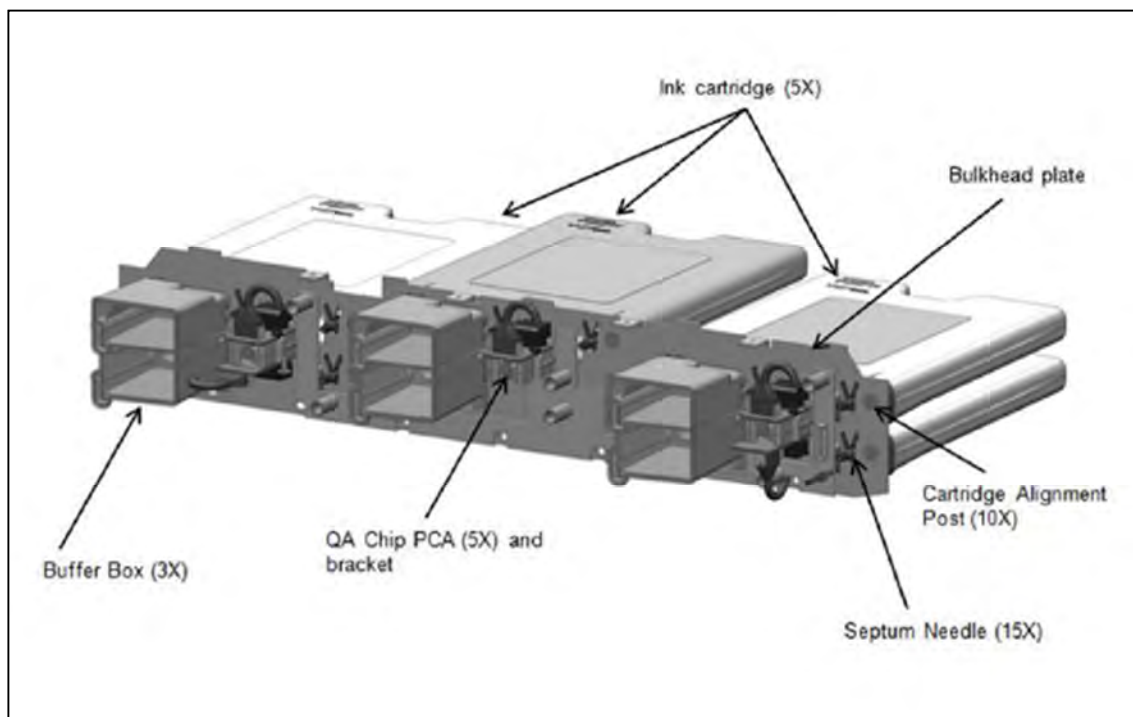
The Ink Delivery System (IDS) is a complex system designed to cleanly and reliably deliver ink to the printhead while minimizing color mixing, drop weight variation, and dehydration.

The major components of the Ink Delivery System (IDS) are:

- The disposable ink cartridges
- The printhead
- The tubing
- The peristaltic pump
- The pinch valve assembly
- The QA and ink level sensing electronics
- The buffer box

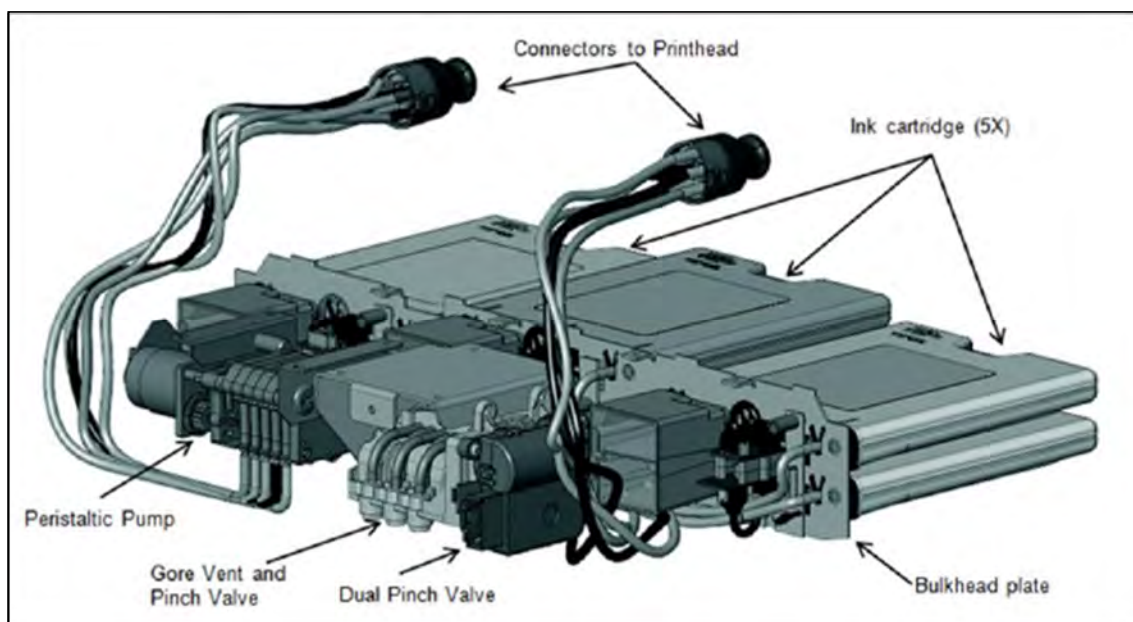
2.10. Bulkhead Assembly

The bulkhead assembly includes the ink cartridges, the septum for connecting to the bulkhead plate, ink level PCAs, the QAI chip for each ink cartridge, and the buffer boxes for each ink cartridge.



Picture of Bulkhead Assembly

Other IDS Components

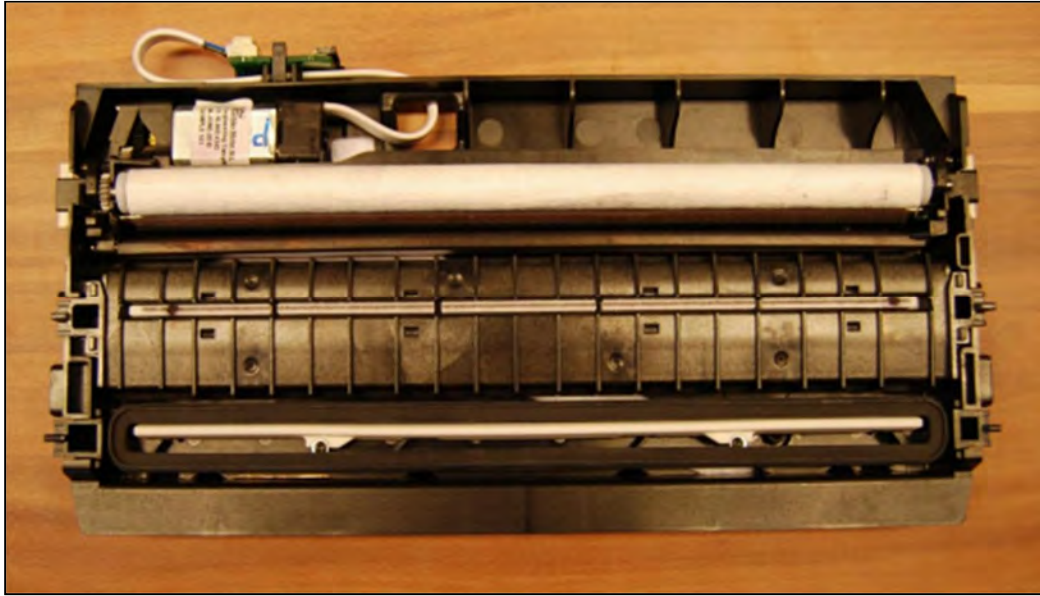


Picture of Other IDS Components

2.10. Maintenance Module

Aka Service Station (SS)

The multi-station, maintenance module (MM) maintains and cleans the printhead by wiping off waste ink and contamination. In addition, the MM assists with printing by priming the printhead, as well as protecting it when not in use, and guiding the paper as it passes under the printhead.



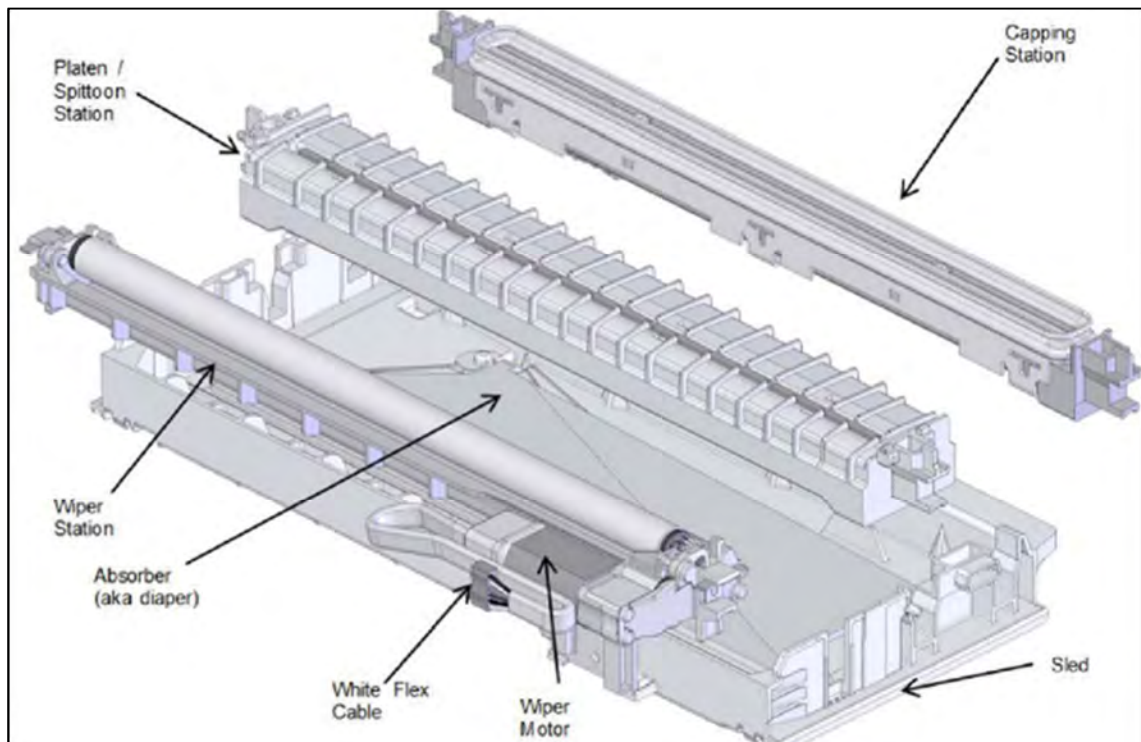
Picture of the Maintenance Module

The maintenance module (MM) is a sled that contains stations for wiper, cap/spittoon, and print zone platen.

To position the correct station into place, a stepper motor moves the sled horizontally, and a DC motor moves the sled vertically.

The maintenance module:

- Cleans the printhead of excess ink and debris.
- Keeps the printhead protected and hydrated while not in use.
- Provides a safe place to spit ink that is used to keep the nozzles clear.
- Provides a suitable base for supporting the media during printing. This is done with the print zone platen station.



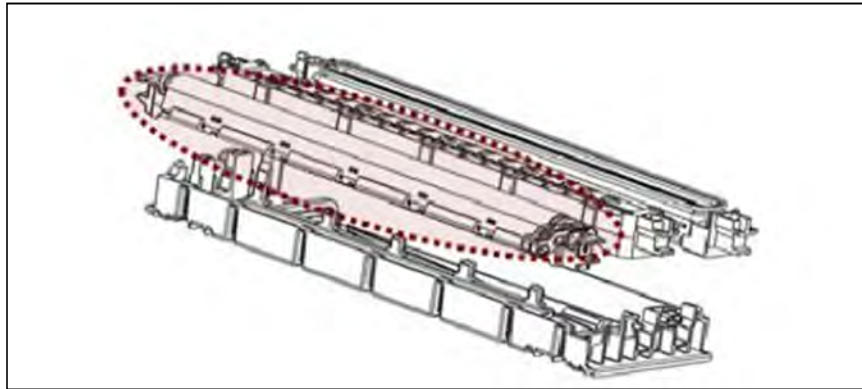
Picture of Maintenance Module (MM) Assembly (exploded view)

The maintenance module should be replaced as part of annual maintenance or after printing one million inches.

NOTE: The maintenance module is not intended to be end-user serviceable, although it is a service part for technicians.

2.12.1. Wiper station

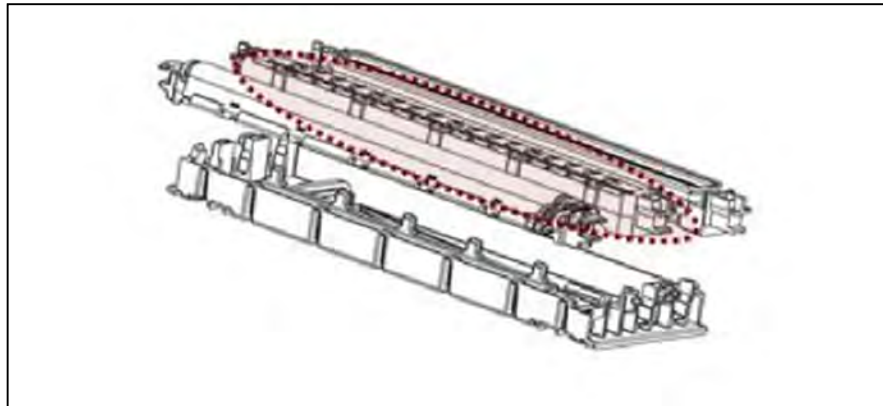
The printhead must be wiped to remove ink cross-contamination and particulates. The cylindrical wiper rotates to wipe the entire width of the printhead. The roller rotates for the duration of the lift-dwell-lower cycle. The intent is not to merely blot the nozzles but to have functionally translational wiping. The wiper is programmable and can be rotated numerous times to perform multiple wiping operations. Once wiping is complete the station drops back down. A metal transfer roller cleaned by a doctor blade helps remove ink from the wiper. The removed ink dries or evaporates within the wiper station. When the wiper becomes contaminated to such an extent that it is no longer effective, the wiper must be replaced by unlatching the two wiper retaining clips. These clips can be released while the maintenance module is in the wipe position.



Picture of the wiperstation

2.12.2. Printing platen

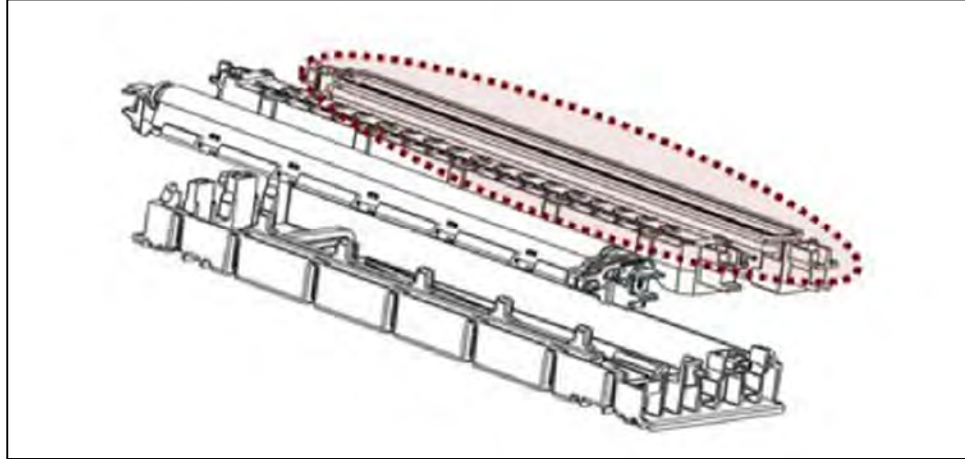
The platen provides a smooth writing surface and the correct spacing between the media and the printhead. During printing, the paper below the printhead is maintained at a fixed dive angle from the drive roller nip and platen below the nozzles to ensure print quality. Along the center of the platen there are four Porex (tm) micro sponges to collect ink overspray.



Picture of Printing platen

2.12.3. Capping/spittoon station

The printhead should not be allowed to dry out after priming. The cap station is used when the printer is idle. The cap station limits evaporation from the printhead by sealing around the nozzles and maintaining a humid environment. The cap is an elastomer seal that fits around and over the printhead nozzles. It is held against the printhead by the lift springs on the maintenance module. The cap aligns with the printhead by features at each end of the maintenance module. The spittoon portion of the station has a waste ink receptacle used to capture ink ejected during maintenance processes. The used ink wicks and drains into the waste tank. The wicking bar is a plastic frame and channel of absorbent material. The absorbent material can be replaced by trained service personnel.



Picture of Capping/spittoon station

2.12.4. Printhead servicing events

The printhead requires cleaning after any of the following events occur:

- A new printhead is installed and primed
- The printhead is removed and then replaced
- The printhead is primed or re-primed with ink
- The printhead is showing signs of contamination

Be aware that ink is used by the print engine during printhead maintenance as well as during printing. All waste ink from the printhead nozzles is contained by the maintenance carousel, either in the spittoon (holds waste ink generated by priming/cleaning) or in the platen (holds waste ink generated during printing). Therefore, periodic maintenance will be required to remove the waste ink.

2.13. Print Zone

The clamshell design allows for accessibility during paper loading and paper jam clearance in the print zone.

2.14. Onboard Print Engine Controller (OmniPEC) and Main Board

The OmniPEC controls all electronic aspects of the printing and print engine operation. The custom 95-pin WaveTech connector connects the printhead to the printhead board, which is

connected by cables to the OmniPEC main board. The OmniPEC allows connections to paper motors, ink level sensors, ink pump and additional sensors.

- Dual resolution file format to
- achieve crisp Print Quality (PQ) yet
- reasonable file size
- 1600 dpi lossless text expansion
- 800 dpi contone JPEG expansion
- Two processors: 650MHz RISC CPU with customized HW assist (image processing focus) and 192MHz SPARC CPU dedicated to the printing pipeline
- Dedicated printing pipeline in HW
- Real-time JPEG compression
- Color Space conversion
- Half-toning
- Dead nozzle compensation
- Printhead data formatting
-

2.15. The Control System

The Printer engine is controlled by the OmniPEC, the Quality Assurance Infrastructure (QAI), and the firmware.

Full-page array printing:

- Calculates 900 million drops/sec
- Drives 70,400 nozzles on the printhead
- JPEG expansion in hardware
- On-chip memory
- Extensive motor control and I/O
- Xscale – compatible 650 MHz CPU
- > 40 million transistors
- USB 2.0

3. Installing the Printer

4.

3.1. Choose a location

The Vortex 851R should be placed on a properly levelled worktable or cabinet which is able to handle the printer's weight and minimum 61 cm (24 inch) wide.

3.2. Unpacking and Setup

The printer is shipped in a strong cardboard or wooden box. Before opening the box, check that the box is not damaged in any way and was not turned upside down during shipment. If signs of damage are found, contact your reseller and inspect the box together.

If the box is undamaged, carefully cut the tape on the box, open the box. Before taking the printer out of the box, make sure a strong and level work surface is prepared for the printer.

NOTE: The printer is heavy. Never attempt to lift and take it out of the box on your own as it can cause lasting injuries. The printer should always be lifted by two persons.

Place the printer on the desk and inspect that no damages are found on the unit.

Unpack the unwinder and the optional rewinder units and place them on the desk next to the printer.

3.3. Checking the contents

Check the parts list to ensure you have received all required components. If the shipment is complete, proceed to the next chapter.

- Vortex 851R Printer
- 1 set of CMYKK ink cartridges (5 cartridges per set)
- 1 printhead
- 1 service station
- 1 main power cable
- 1 paper guide
- Unwinder (Rewinder optional)



Printer and contents



Rewinder/Unwinder

3.4. Connecting the Vortex 851R

Make sure the printer is used with the mains cable suited to the requirements of the electrical system of your country. The internal power supply in the Printer is rated 115 to 240VAC, 50/60 Hz.

- Insert the cable into the printer first. The cable connector should sit in the socket securely.
- Insert the cable into the mains socket.



CAUTION

Do not use an outlet that shares the same circuit with large electrical machines or appliances

Turning Power On/Off

Powering Up:

1. Turn on the main switch and
2. Press the Main Power Button on top of the Printer.

Powering Down Printer:

1. Press Main Power button on the top of the Printer, and wait until the engine is turned off.
2. And turn off the machine with the main switch.

OR

1. Open the Toolbox and press 'Shutdown'.
2. Wait for the printer to stop processing, and the toolbox write out the printer not responding
3. Switch off the mainswitch.

CAUTION

Whenever powering down the unit NEVER:

- 1.) Never remove the power cable during the shutdown process**
- 2.) Never switch off the printer with the Main Power Button when the engine is still running**

3.5. Setting up the Printer

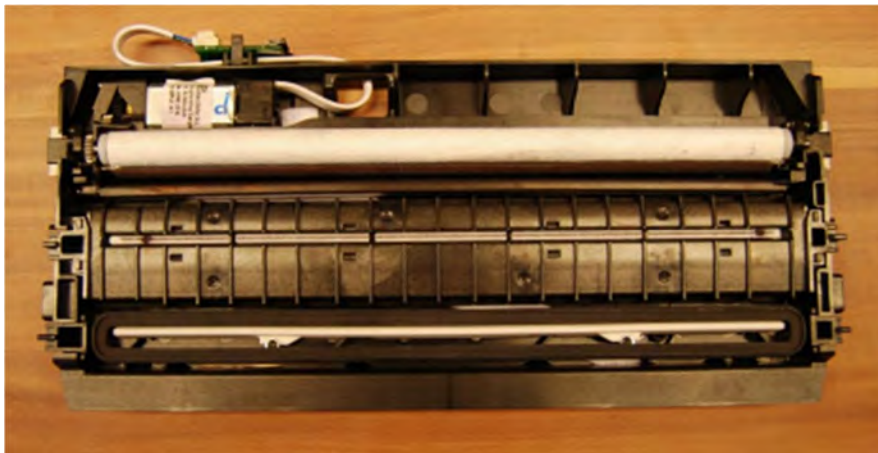
After the printer has passed inspection, install the maintenance module, the printhead, and the ink cartridges, as explained in the following sections.

To set up the printer you need to do the following:

1. Install the Service Station (if shipped as a separate unit)
2. Install the ink cartridges
3. Install the printhead
4. Turn on the Printer
5. Unwinder setup
6. Load label media
7. Install the printer driver

3.5.1 Maintenance Module (MM)

In case your printer is shipped with a MM as a separate unit, before switching on the printer, you need to install the MM (After module has passed inspection).



Service Station (aka Maintenance Module)

The Service Station cleans the Printhead Cartridge of excess ink and debris, keeps the Printhead hydrated and protected when not in use, captures ink used to keep nozzles clear, and acts as a base to support media during printing.

CAUTION

Make sure latches on the Wiper Roller are properly closed before installing the Maintenance Module

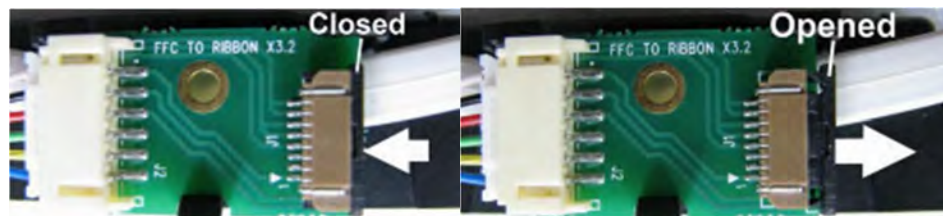
Installation steps:

- Unpack the Maintenance Module
- Check that each part of the station is complete and functional
- Open the printer and the ink tank cover
- Open the print engine clamshell
- Locate the MM ribbon cable
- Connect the ribbon cable to the MM connector at the back of the service station
- Insert the station into the print engine

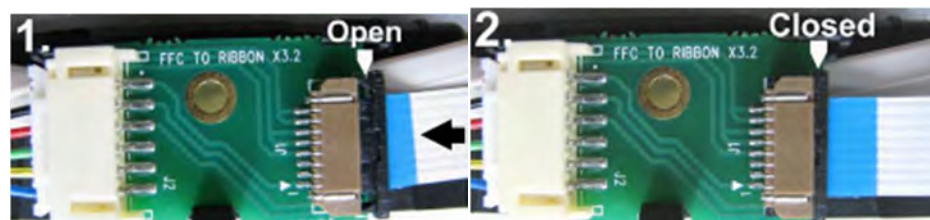


The Service Station fits in the port immediately above the Ink Tank Station.

1. Plug in the white flat flex cable to the motor PCA on the maintenance module.
Slide the Latch open on the Maintenance Station Circuit Board:



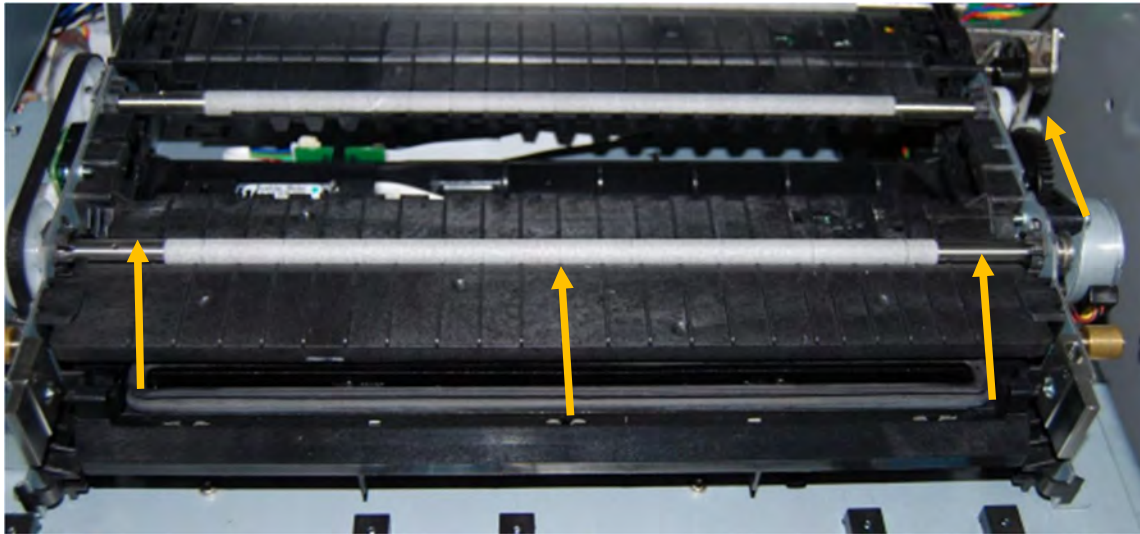
Plug the ribbon connector (blue side up) into the space under the Latch than close the Latch:



2. Slide in the connected Service Station.



3. Slowly turn the gear on the print engine until the maintenance module engages.



4. Close the clamshell gently to avoid causing vibration on the printhead

NOTE: The MM must be perfectly aligned with bar to prevent misalignment!

3.5.2 Installing Ink Cartridges

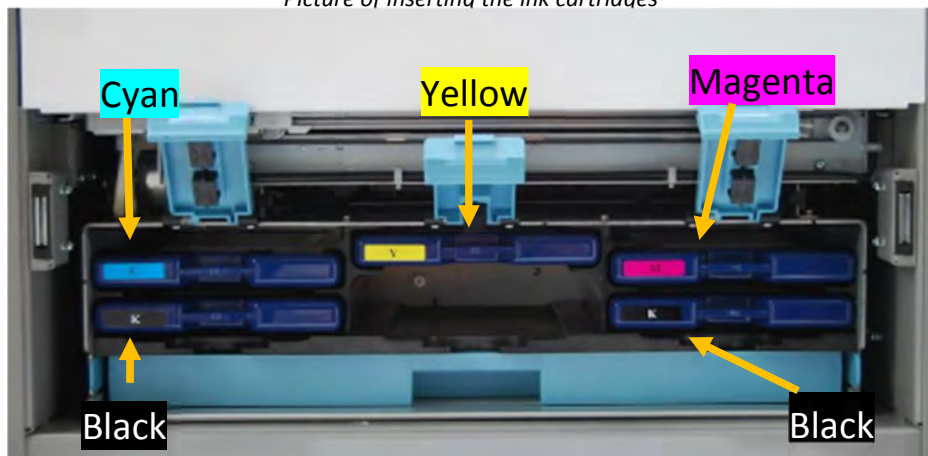
Vortex 851R Series Printers use a single Printhead Cartridge and five Ink Tanks (two Black, one Cyan, one Magenta, and one Yellow). During installing the ink cartridges the Printer should be turned off.

- Remove the ink tanks from the shipping box.
- Open the ink tank latches in the front of the printer by pushing the bottom of the latch upward. The latch has a marker for signalling the place of the C, M, Y and K tanks. (*The reason why K is used for Black: in RGB color mode B is reserved for Blue*)
- Locate the place where each tank should go then slowly but firmly push the tank into the tank socket. The pressure in the ink tanks and the septums may prevent the cartridge to fully engage for the first insertion.

To make sure you have a good contact, remove the ink tank and re-insert twice.



Picture of inserting the ink cartridges



□ Cyan (C), inserted in the top left slot.

- Black (K) – two cartridges – inserted in the bottom left and bottom right slots.
- Yellow (Y), inserted in the top middle slot.
- Magenta (M), inserted in the top right slot.

WARNING: The ink 29nt he Ink Tanks may be harmful if swallowed. Keep new and used Tanks out or reach of children. Discard empty tanks immediately.

3.5.3. Installing the Printhead

The printhead is the core of the print engine. As sensitive electromechanical equipment, it requires careful and special handling to avoid damage and ensure quality printing. **NOTE:** The printhead is sensitive to electro-static discharge (ESD). Use ESD protection when handling the printhead.

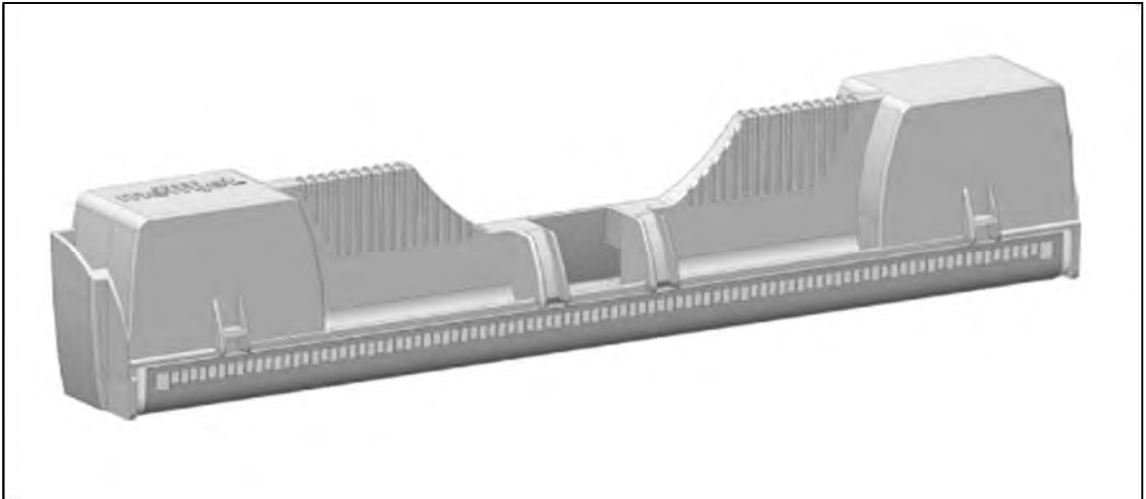
Priming the Printhead

Before the printhead can be used, it must be primed. Priming helps purge both the liquid and air in the ink lines to allow reliable printing. Priming can also help to remove air

bubbles from a previously primed printhead. The priming process is designed to use less than 5ml of ink.

To prime the printhead manually,

1. Fill the main channels of the printhead.
2. Generate a pressure pulse to push out any bubbles.
3. Clean and dispose of the ink pushed out onto the nozzle plate.
4. Print out color mixed ink.
5. Cap the printhead to prevent dehydration.



CAUTION

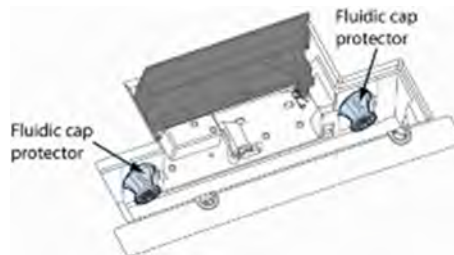
- ❑ **DO NOT touch the printhead cartridge ink couplings, nozzle surface or the electrical contacts when installing the printhead cartridge. Hold the printhead cartridge ONLY by the handles.**
- ❑ **DO NOT unpack the Printhead Cartridge until the Printer is ready for installation. Once unwrapped, delay in installing the Printhead can compromise print quality due to dehydration.**
- ❑ **DO NOT place an unwrapped Printhead on any surface before installing. Protect the Printhead from at all times from dust, fibers, dirt and other contaminants.**

Installing the Printhead

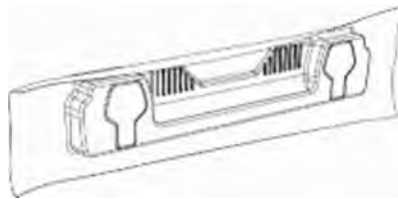
1. Ensure your printer is switched on and the Power button is lit and steady.
2. Open the cover of your printer to reveal the printhead latch with a screw driver (**ONLY at first use!**)



3. If the printhead latch is not raised, press the Printhead Eject button for three seconds. This will automatically initiate printhead latch opening. This process may take several seconds.
4. Remove the fluidic cap protectors from the two fluidic couplings.



5. Open the end of the printhead package outer box and slide out the foil bag.



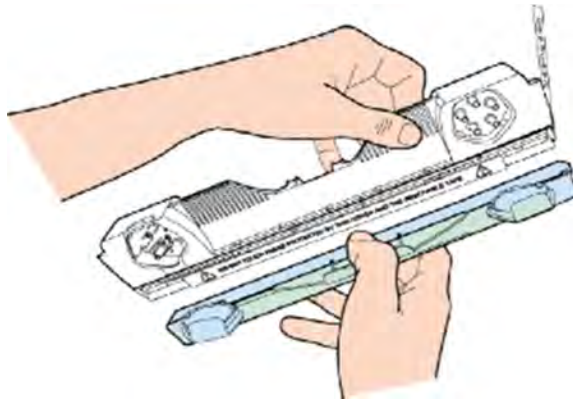
Inspect the integrity of the foil vacuum sealing. The foil bag should be formed tightly to the contours of the printhead cartridge as shown above. If the foil is loose to any degree then the seal has been compromised.

If a poor seal is suspected, DO NOT USE the printhead cartridge. Report the issue to your supplier.

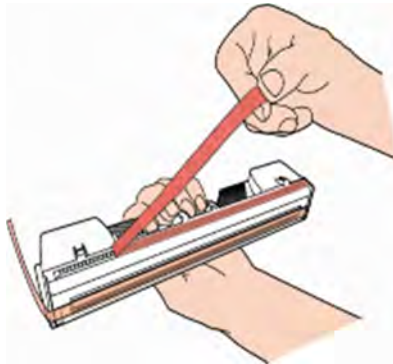
6. Carefully rip the foil packaging open at the notch. Use scissors if your foil bag does not have a notch or you are finding it difficult to tear the bag.



7. Remove the printhead cartridge from the foil bag.
8. Remove the orange protective plastic cover from the printhead cartridge. Holding the printhead cartridge by the handle
 - a. Release the flaps covering the ink ports (1 and 2).
 - b. Release the clip retaining the cover near the center of the printhead cartridge (3).
 - c. Carefully remove the protective cover (4).

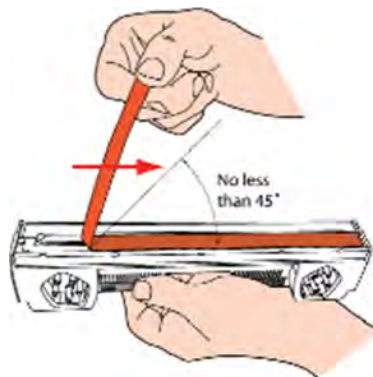


9. Remove the protective strip from the electrical contacts. While holding the printhead cartridge by the handle with one hand, grasp the pull tab with the other hand and, slowly and carefully, peel back the plastic strip covering the electrical contacts.



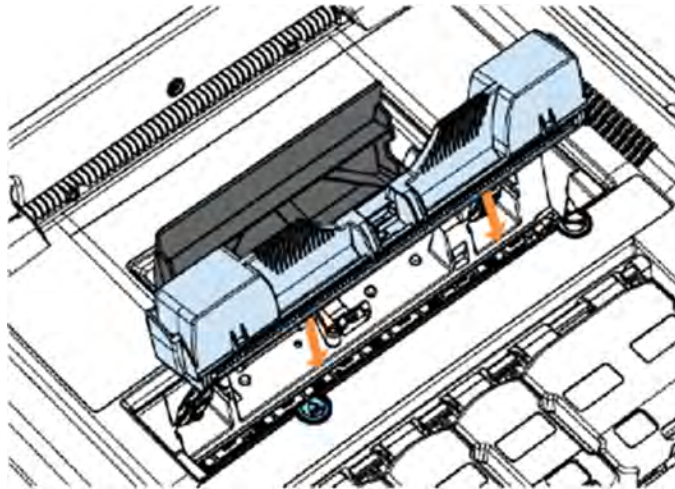
Dispose of the removed strip immediately and do not allow the removed strip to contact the electrical contacts.

10. Remove the protective strip from the printhead nozzles. While holding the printhead cartridge by the handle with one hand, grasp the pull tab with the other hand and slowly and carefully peel back the plastic strip covering the printhead nozzles. Maintain an angle of no less than 45° with the printhead surface when pulling on the strip.

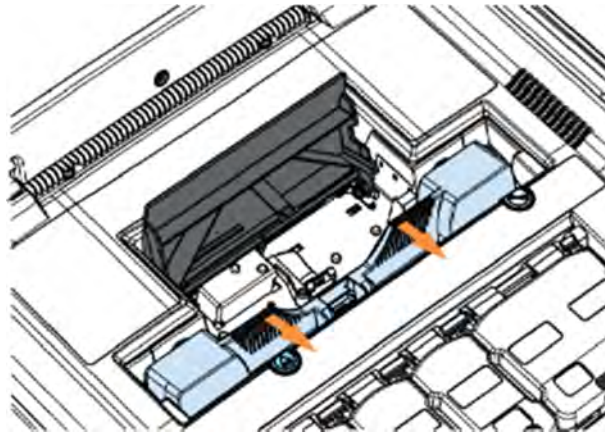


Dispose of the removed strip immediately and do not allow the removed strip to contact the electrical contacts or the printhead nozzles.

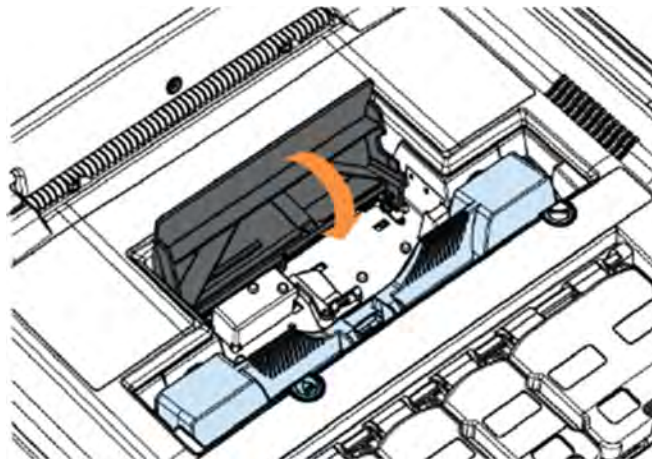
11. Raise the printhead latch fully until it is upright so you can insert the printhead into the printer at an angle.



12. When the printhead cartridge is fully inserted into the printer rotate it to a vertical position as shown.



13. Slowly close the printhead latch. The fluidic couplings should advance and seal to the printhead cartridge.



14. Close the printhead latch. When the printhead latch is closed, the printer will prime, clean and cap the printhead automatically. This operation will generally take a minute or two, and will be obvious from sounds emanating from the printer.

NOTE: The Printer may take up to 12 minutes to set itself up during initial startup. This is normal. The machine will emit a number of chirps, whirrs and other noises as it circulates ink and runs systems.

CAUTION

Do not remove the Printhead while fluid is primed in the system!

3.5.4. Switch on the Printer

After the print head and the ink tanks are installed, switch on the printer by switching on the main switch on the back of the printer. This will power up the print engine and the controllers.

After few seconds, you will hear the ink pump starting to prime the system, then the wiper will wipe the print head and starts its first maintenance. During this process the software is starting to build up the connection to the print engine. This can take up to 10-15 minutes but it is normal so please wait until the GUI for the system indicates that it is in the ready state.

3.5.5. Media Handling

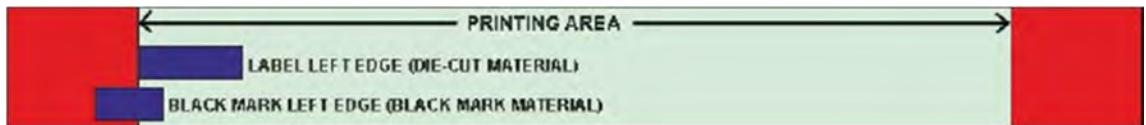
3.5.1.1. Print Area

Print area can be found on the back of the printer where the operator needs to feed the materials. Any media type must go through the metal paper guide in order to avoid any movement during printing.



Picture of Paper guide

Printing Area is dedicated with the green bar. Left edges of Label (Gap) Sensor and Blackmark (Tickmark) Sensor is shown with the blue marks. During printing the operator has to align the actual material to these blue marks otherwise the sensors won't be able to recognize the media and the printer could run into an error.



Picture of Printing Area

3.5.1.2. Load Media

Take the paper from the roll and see across under the unwinder's roller. Don't forget to do this because this will strain the label media during printing.



Drag the paper towards and see across the roller of the paper guide under the antistatic brushes. Feed the paper in the printer till you feel some resistance.

3.6. Connect the printer to a computer

3.6.1. Direct connection to a personal computer

The printer connect to directly via USB AB cable and a TCP/IP cable. For the driver installation advice to use the USB AB cable, or install that in offline mode and after the installtion seletc the correct port for the USB usage.

3.7. Installing the Printer Driver

Your printer can be installed:

- A) online via Network
- B) via direct USB connection

The preferred installation is over Network, since USB installation process may conflict with previously installed USB printer software.

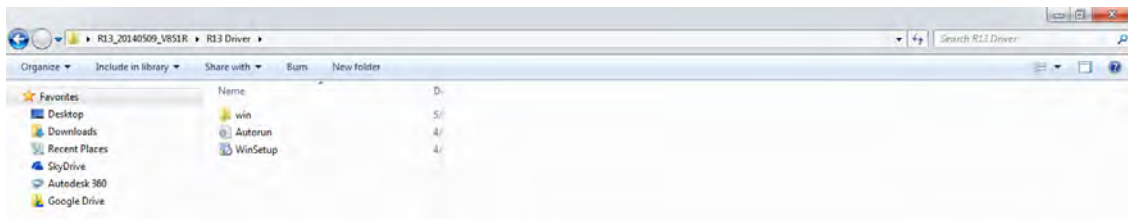
A) Installing Printer online via Network Setup Steps:

Make sure your printer is turned on and online

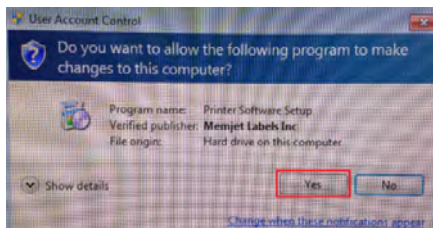
Your printer is connected to your network via LAN cable

Your PC is connected to the same network (LAN or WIFI)

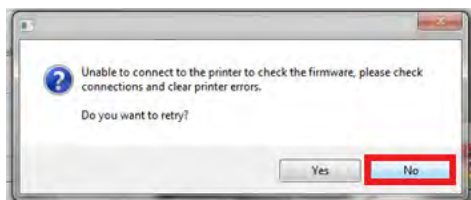
1. On the user PC or laptop, open folder that contains the printer driver software 'R13 driver' and run WinSetup.exe:



2. As the installer starts, Windows will prompt for permission. Click 'Yes':



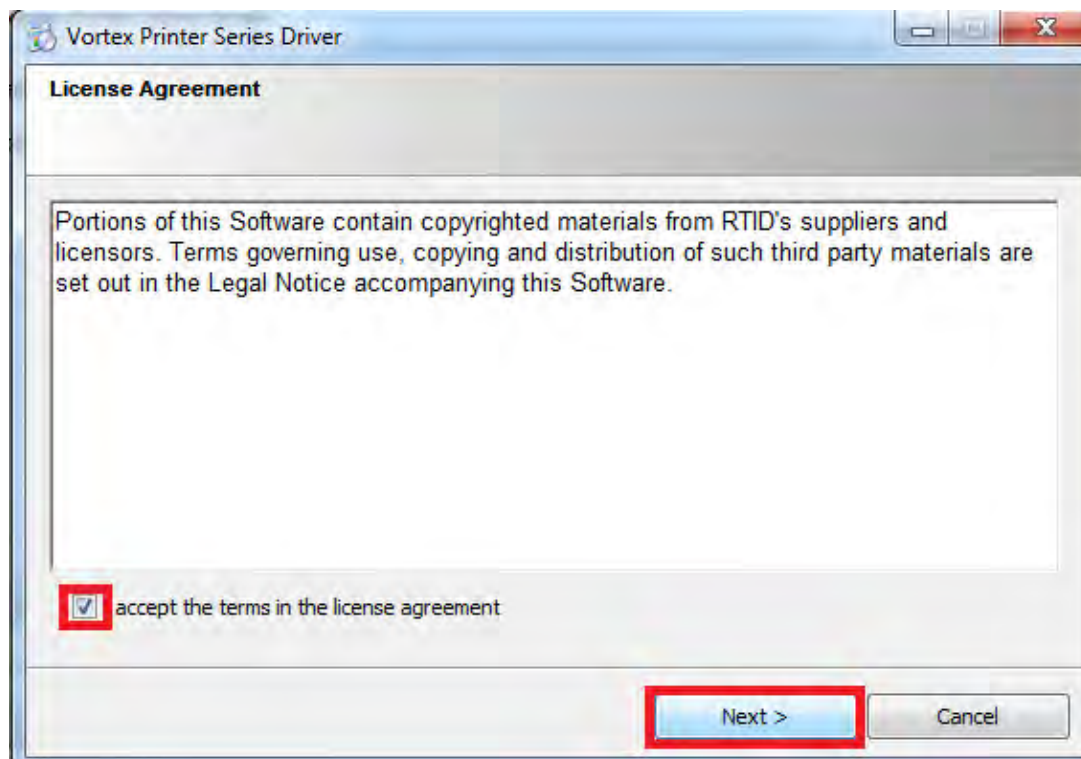
During setup the software may ask for 'Run firmware update'. In such case select 'No'.



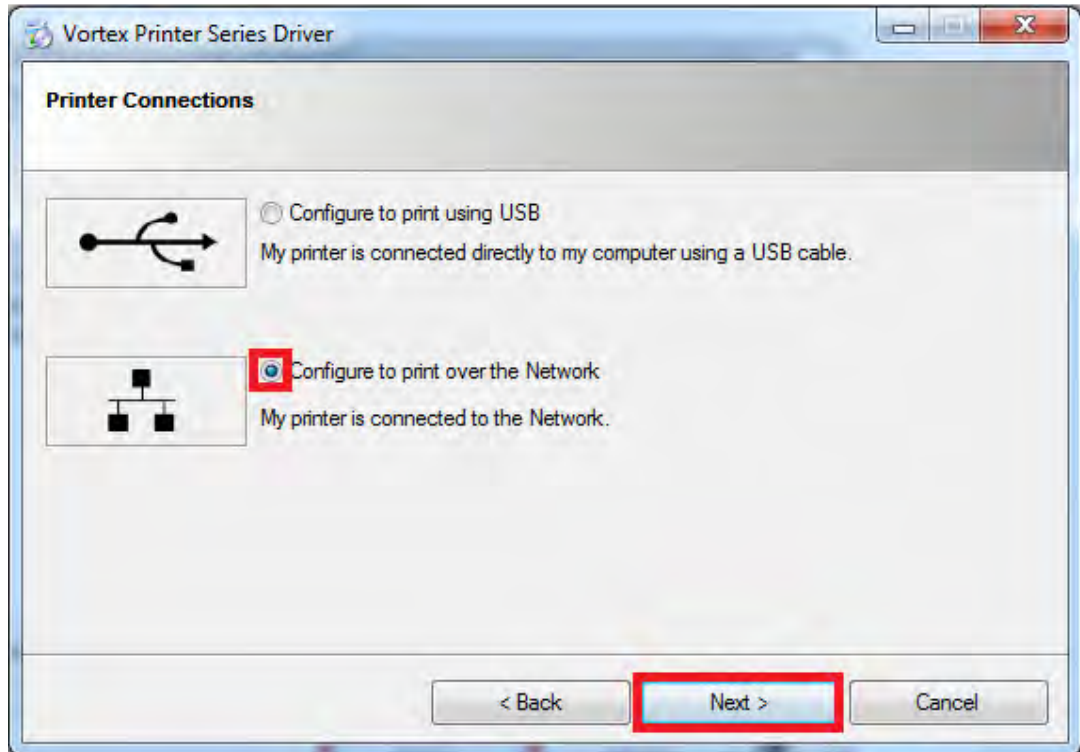
3. The setup console will start:



4. Click 'Install printer software' and accept the terms in the license agreement, then click 'Next'.

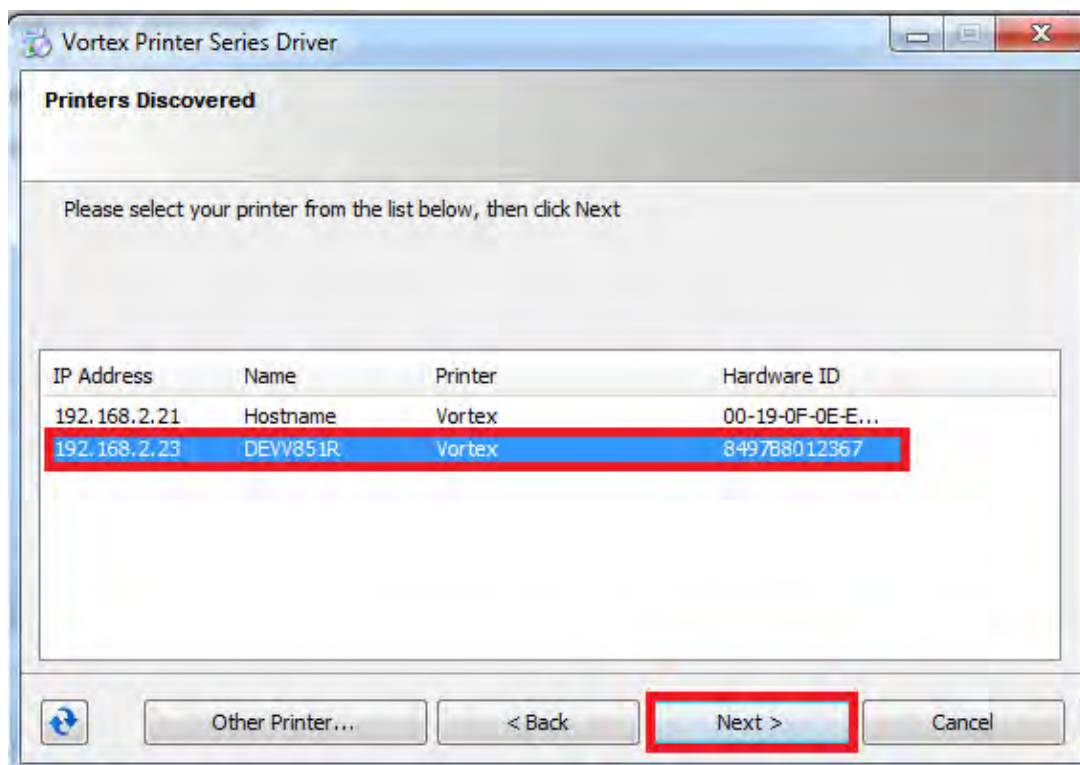


5. When asked, select 'Configure to print over the Network'

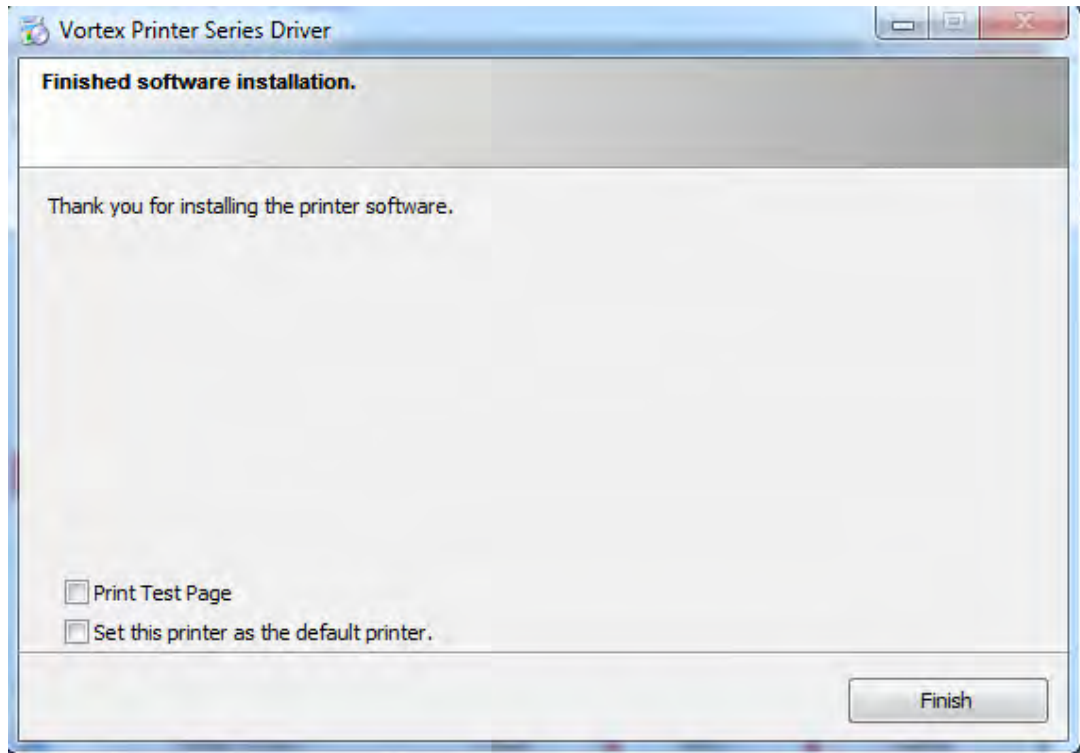


6. The installation will begin and a new window will pop-up with the available printers on the network.

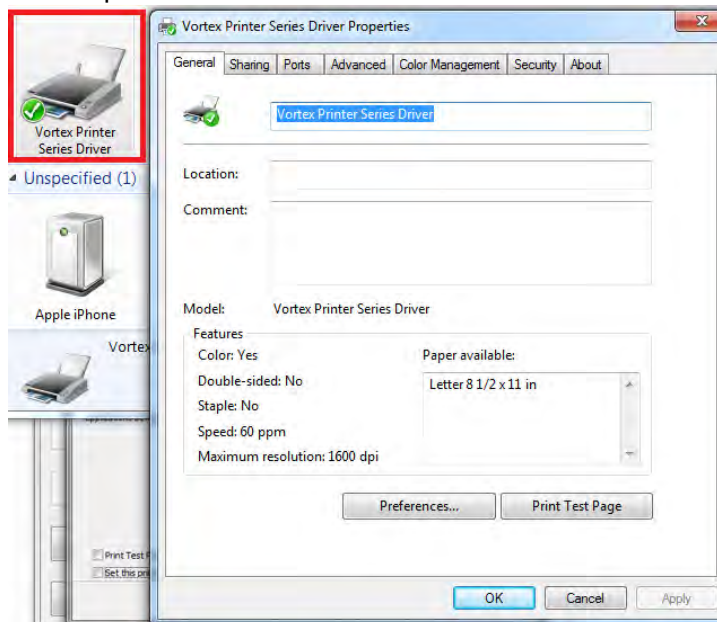
Select your printer and click Next.



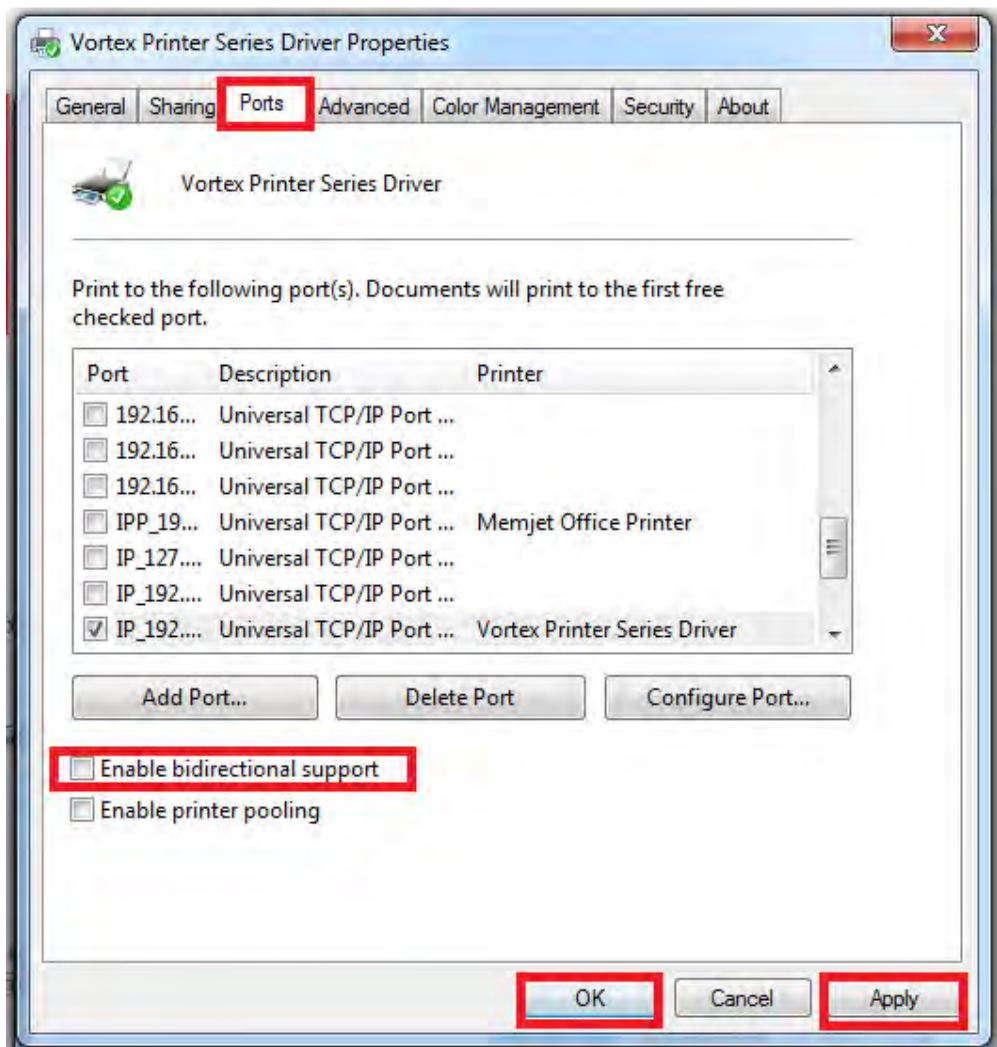
7. When the installation is finished, you can set this printer as default and/or print test page (not necessary). Click Finish button and exit the installer.



8. Open Windows/Devices and Printers, right click on Vortex Printer Series Driver and select Printer Properties



9. Select Ports tab from the top and deselect Enable bidirectional printing.



Click Apply and OK.

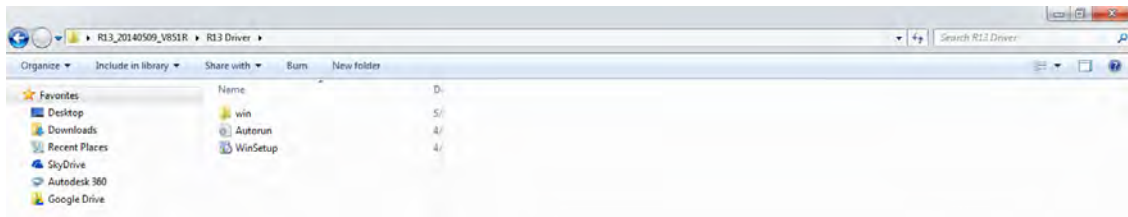
Printer installation is finished.

B) Installing Printer via direct USB connection.

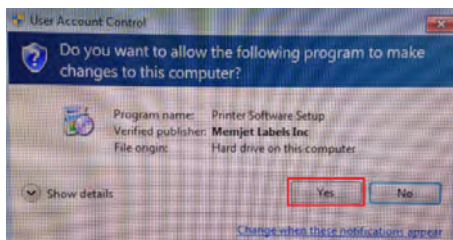
For this method, make sure:

- Your printer is turned on
- You have connected your PC to the printer with USB AB cable.

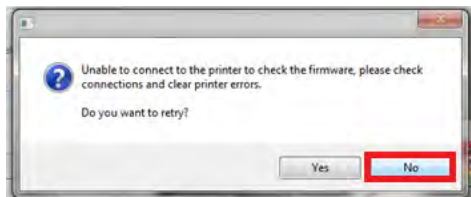
1. On the user PC or laptop, open folder that contains the printer driver software 'R13 driver' and run WinSetup.exe:



2. As the installer starts, Windows will prompt for permission. Click 'Yes':



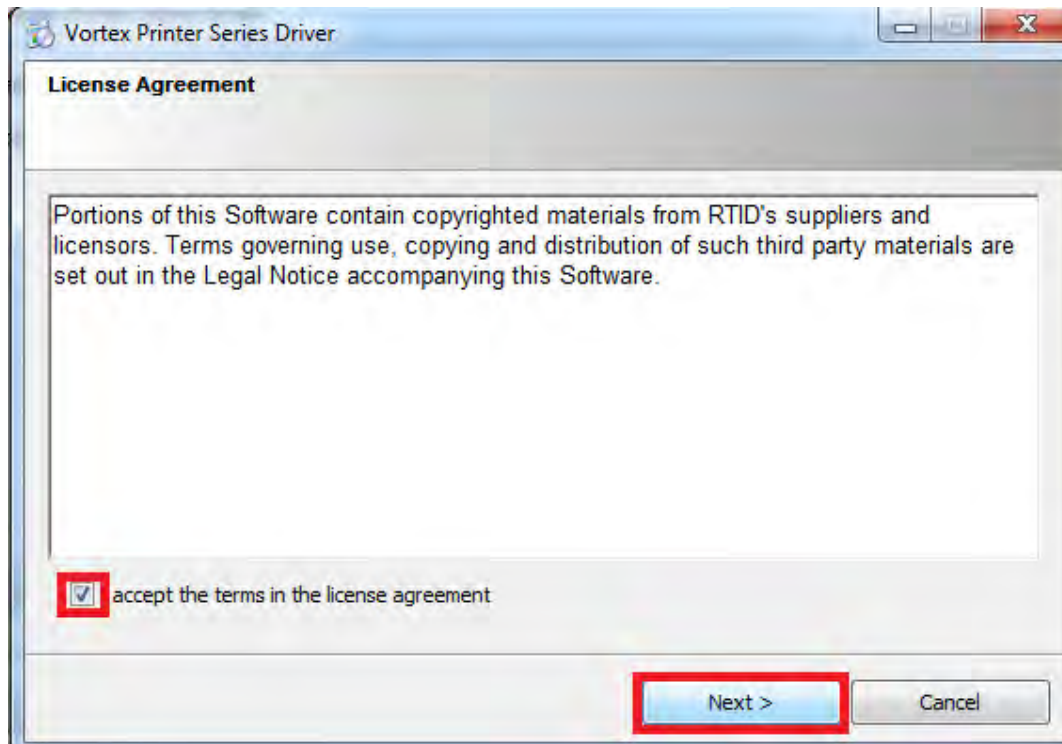
During setup the software may ask for 'Run firmware update'. In such case select 'No'.



3. The setup console will start:



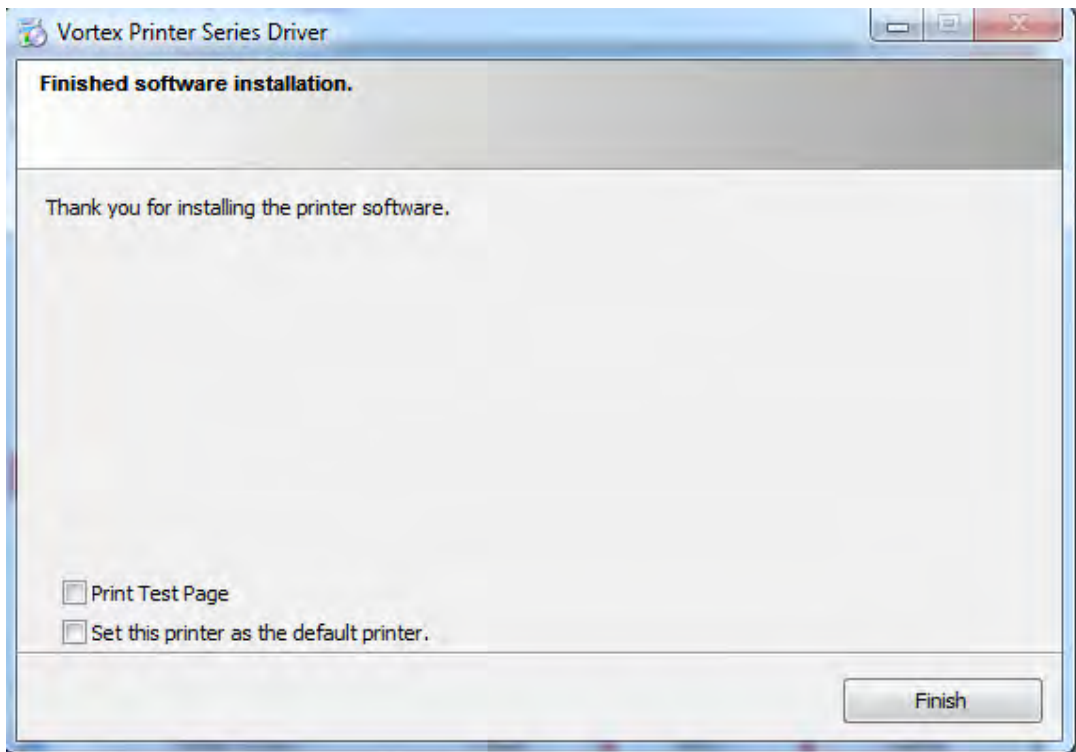
4. Click 'Install printer software' and accept the terms in the license agreement, then click 'Next'.



5. When asked, select 'Configure to print using USB'.



6. When the installation is finished, you can set this printer as default and/or print test page (not necessary). Click Finish button and exit the installer.



Installation is finished.

3.7.1. Driver Specifications – Printer Preferences

3.7.1.0. General Tab

Orientation: Portrait(default), Landscape, Rotate 180° and Mirrored

Copies:

Lets you choose the number of copies to be printed.

If choose the reverse order then the jobs starts printing after the last page is arrived.

PrintSpeed:

6IPS is the Best quality mode with 1600*1600 dpi.

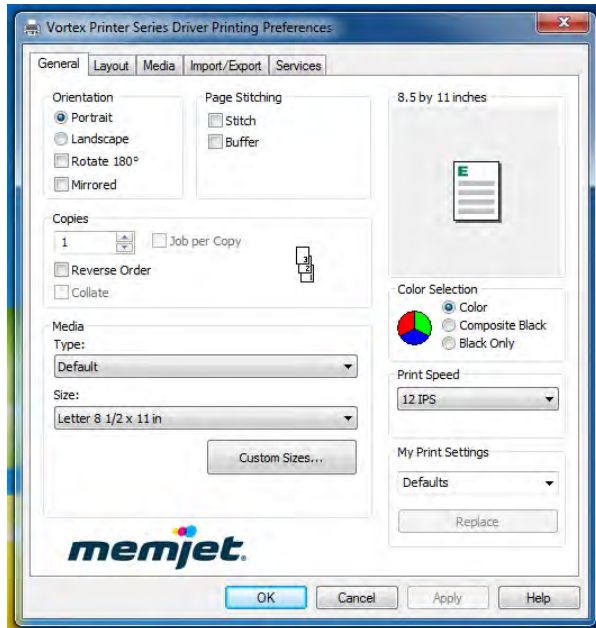
12IPS is the normal with 1600*800 dpi.

My Print settings:

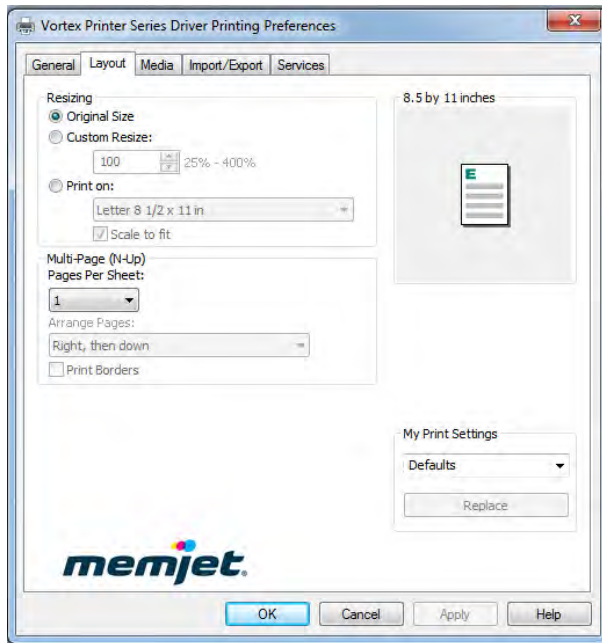
Acces your costum print settings for various jobs that you uploaded through the „Media Profile

Upload+ int he Toolbox-

Media type and media size are defined by the Vortex 851R Series Driver and included during installation.



Field	Values	
Media Type	• Default • SpeedJet Glossy Label • SpeedJet Matte Label • SpeedJet Standard Label • SpeedJet Vellum	
Media Size	• Letter 8 ½ x 11 in • Legal 8 ½ x 14 in • Statement 5 ½ x 8 ½ in • Executive 7 ¼ x 10 ½ in • A4 210 x 297 mm • A5 148 x 210 mm • A6 105 x 148 mm • 4 x 6 in • 5 x 7 in • 5 x 8 in	• □ 4 x 10 in • □ 4 x 11 in • □ 4 x 12 in □ 8 x 10 in • □ Env. Monarch 3 7/8 x 7 ½ in • Env. Com 10 4 1/8 x 9 ½ in • Env. DL 110 x 220 mm - Hagaki 100 x 148 mm 100 x 150 mm 1 x 1 in
Print Speed (and Quality)	• 12 IPS • 6IPS	
Color Section	• Color • Composite • Black only	
My Print Settings	□ Defaults	



3.7.1.1. Layout Tab

Resizing –

Lets you specify the

Original Size or

Custom Resize: lets you resize the original as a % of normal size. The printer will print the document in the size you selected regardless of the size of the paper selected.

Print on: lets you specify the particular size of paper that you want to print on regardless of the size of the original document. Checking “Scale to Fit” automatically resizes the document to fit on the new page size.

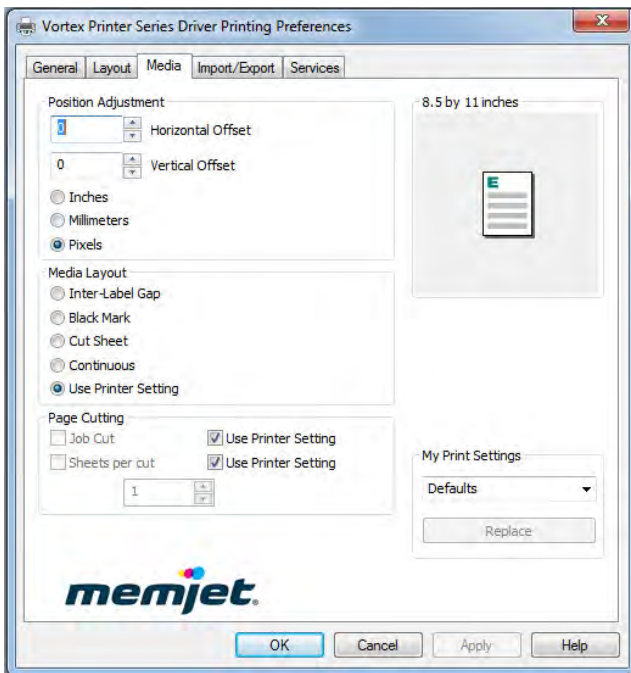
Multipage per N-UP

If would like to print more pages on the same sheet

My Print Settings: Access your custom print settings for various jobs that you uploaded through the “Media Profile Upload” in the Toolbox.

Field	Values
Multi-Page (N-Up)	Pages per Sheet: 1,2,4,9,16
Arrange Pages	• Right, then down • Down, then right • Left, then down • Down then left
My Print Settings	▣ Defaults

3.7.1.2.Media Tab



Printing Adjustments: Allows you to make minor positioning changes to the print area in relation to the media if needed.

NOTE: Only works on jobs using less than the full print area (less than 8.5" wide).

Media Layout:

possible to set what kind of print jobs will arrived.

Inter-Label Gap: the media has labels form

Blackmark: the media has blacemark ont he

DOWNSIDE

CUTSheet: cut after the medium size

Continous: in this mode the machine will print fluently

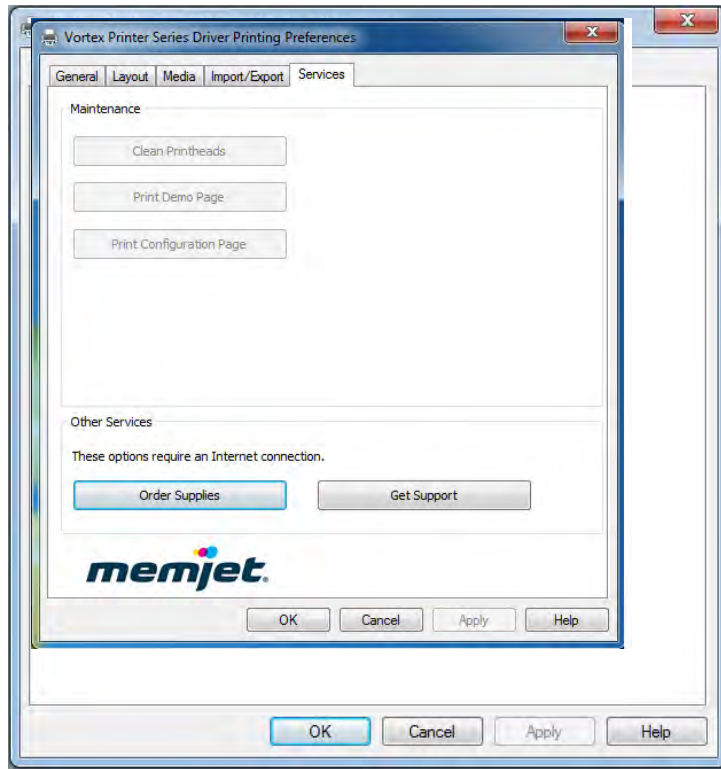
Use printer setting: the engine has some setting what can check with the nvm_getset command. For more information about under

the engine documentation.

My Print Settings: Access your custom print settings for various jobs that you uploaded through the "Media Profile Upload" in the Toolbox.

Field	Values
Position Adjustment	- Horizontal Offset - Vertical Offset
(offset units)	- Inches - Millimeters - Pixels
Media Layout	- Inter-Label Gap - Black Mark - Cut Sheet - Continuous - Use Printer Setting
Page Cutting	- Job Cut (cut at end of job) - Sheet per cut (number of pages before cutting) - Use Printer Settings
My Print Settings	Defaults

3.7.1.3.Import/Export



When updating to new Memjet driver, the Import/Export tab is used to save previously adjusted media sizes and My Print Settings.

You can also use this function to copy printer and media settings from one PC to another.

When exporting these settings, an .ini file will be generated, which can be copied onto another computer, - where the driver is installed as well - and can be imported simply.

3.7.1.4. Services

When printer is online, Service menu can be used to carry out manual (not automated/programmed) maintenance by simply clicking on CLEAN PRINTHEADS button.

PRINTING DEMO PAGE will print Windows demo page.

Make sure you have wide enough – 210mm – continuous media fed into the printer prior using this function)

PRINT CONFIGURATION PAGE will print printer configuration page (IP address etc.)

Make sure you have wide enough – 210mm – continuous media fed into the printer prior using this function.

3.8. Label printing, generating print jobs.

For printing labels the operator has two options:

*Print label from a labelling/graphical or other software

*Print labels from print jobs.

3.8.1. Printing labels from softwares

Printing labels from any kind of software is quite easy. The operator just needs to set all preferences within the Vortex 851R Series Driver (paper size, printing speed, number of copies, etc.)

3.8.2. Printing labels from print jobs.

To help the whole process it is recommended to install the driver on the personal computer then change the following:

1. Go to Start/Devices and Printer
2. Right click on Vortex 851R Series
3. Go to Printer Configuration
4. Go to Ports tab
5. Change port from TCP/IP to FILE (or Print to File)

Print jobs are pre-defined printjobs which could be usable in the future. The Vortex 851R printer is only working with .PRN files which can be generated from the driver of the printer.

3.9.0. Printers Buttons

Power button /green LED/

When push the power button, the engine will start and start to priming or will do a little maintenance. At first start should to wait lot time (10-15mins) because the ink delivery system is empty. Sometimes it takes more than ten minutes. But if the system primed after this time is shorter.

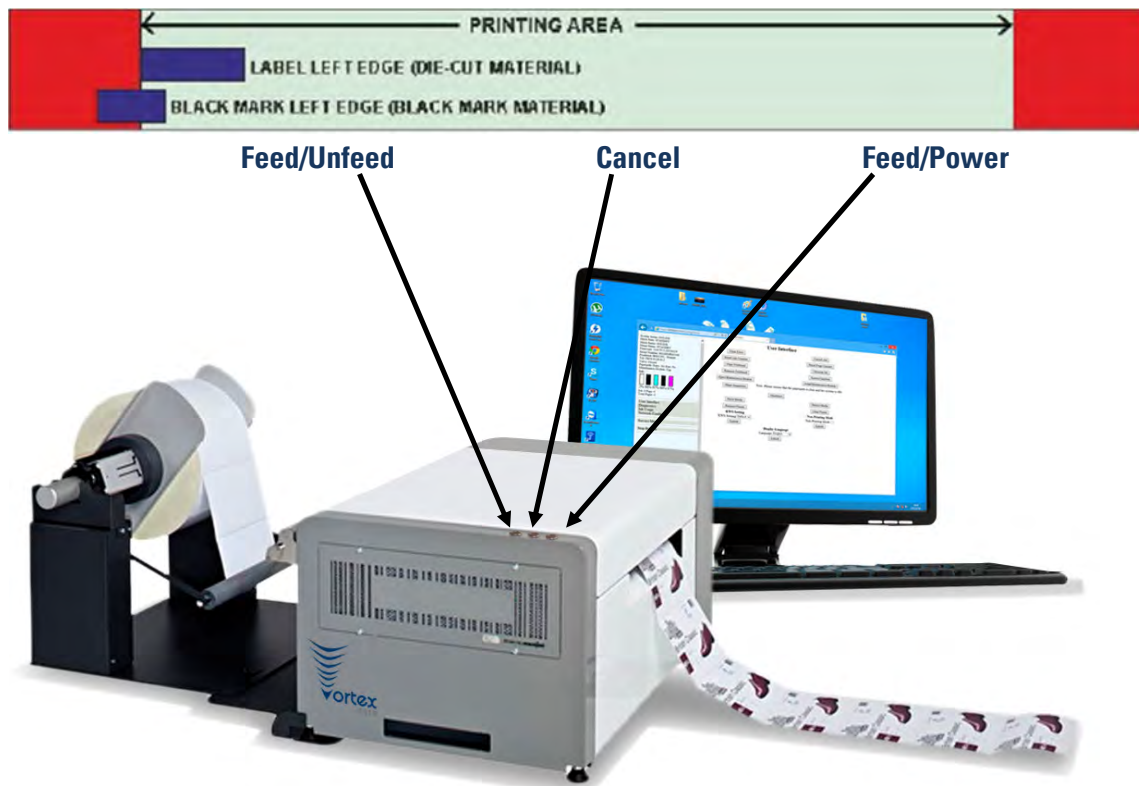
The green LED always should to light when the machine is ON.

Cancel button /red LED/

This button can cancel the job under the printing. The LED is working only if the button pressed.

Feed button /yellow LED/

Before printing should to feed the media into the machine. Advice to place the media to the left side of the machine because the print engine has the gap and balckmark sensors also there.



3.9.1. Buttons and Led signals

The first button from the left is the Power button, with an integrated Green led. The second button is the Cancel / Clear Error with a Red led and the last one is the Feed/Unfeed with a Yellow led. The power button only sorts two GPIO pins so it does not require any kind of software for its operation, consequently it can be used to power on the engine during the manufacturing process even if there is no firmware on the machine. The other buttons need the custom firmware components added by the "V851R_CustomFW.tcl" to be running.

The integrated leds in the buttons are used to give further information about the printer's current state, these are listed in the Led Table below:

Led Table:

Green Led: *Power Status*

- Led On: Engine ON
- Led OFF: Engine OFF

Red Led: *Cancel Job / Clear Error*

- Led Off: Normal operation-> Button press will Cancel current job
- Led On: Error detected -> Button press will start the Clear Error procedure, further error info can be denoted by the yellow led's status described below
- Led Blinking: Doing work (cancelling or clearing error)

Yellow Led: *Feed / Unfeed*

- Button press will initiate Feed or Unfeed process depending on the current paper status of the printer.
- Led Blinking : Doing work (feeding on unfeeding)
- Led On + Red Led On: Engine in Paperpath related error state, denotes Paperjam in 95% of the time
- Led Blinking + Red Led On: Engine in Paperpath_end_of_roll error state, so there is no paper in the printer or it is unable to detect it

Provides access to the Printer User Control screen. From this screen you can Clear Errors, Cancel a Job, Reset the Job Counter and Reset the Page Counter. You can also perform some maintenance and operating tasks such as:

Clear Error: If the engine is in error status, it is possible to delete with this button. There are some fatal states that are unable to delete.

Cancel job: delete the actual jobs. For example, if the machine is in error state and won't delete the jobs, after cancel job it will print out the missed jobs again.

Reset job counter: this will reset the job counter

Reset Page Counter: this will reset the page counter

Wipe Printhead: this is a cleaning service issue. It will carry out a light cleaning on the printhead.

Circulate Ink: Purges air from the pipes and primes the system after replacing the Ink Tanks or Printhead Cartridge.

Release Printhead: Performs the same task as the Cover Release Button on the Printer. Pumps the ink back into the Ink Tanks and opens the Printhead Cover to remove/install the Printhead.

System Depriime: Pumps the ink back into the Ink Tanks prior to replacing the Printhead or transporting the Printer.

Eject Maintenance Module: this will eject the service station. If you would like to remove it then use this at first. If not possible to use this button still can remove it manually.

Install Maintane Module: this will call home the service station.

Wiper Inspection: sets the service station in wiper state, so the wiper roller faces upward and can be inspected.

Wiper Preemptive Maintenance: It enables users to re-moisturize the wiper module with ink to recover from the excessive dehydration in the system.

This algorithm is user-initiated only. It is recommended that it be run once a week, as well as after extended durations of printer idle time.

Shutdown: Turns the Printer off from your computer.

Pinch Media: this will feed the media.

Retract media: this will unfeed the media

Request Pause: send pause command

Clear Pause: clear pause state

KWS setting: 0, default(3), 7- IMPORTANT! if you change the default settings the printhead will loose its warranty! If Keep Wet Spitting function isn't working then the printhead nozzles have bigger chance of drying out what will make printing mistakes. Lines. This function is a basic defence of the printhead.

Non Printing Mode: In this mode the printer can calculate inkusage from the job.

Shutdown the Printer: this will shut the engine down. After this the printer itself also needs to be switched off.

4.2.Diagnostics

From this screen you can see the current status of your Printer. You can also:

Print Sample Page – Prints type and color bands to check print quality.

Print Configuration Page – Shows the current configuration of the Printer including Firmware Version, Network Connection, Printer Serial Number and more.

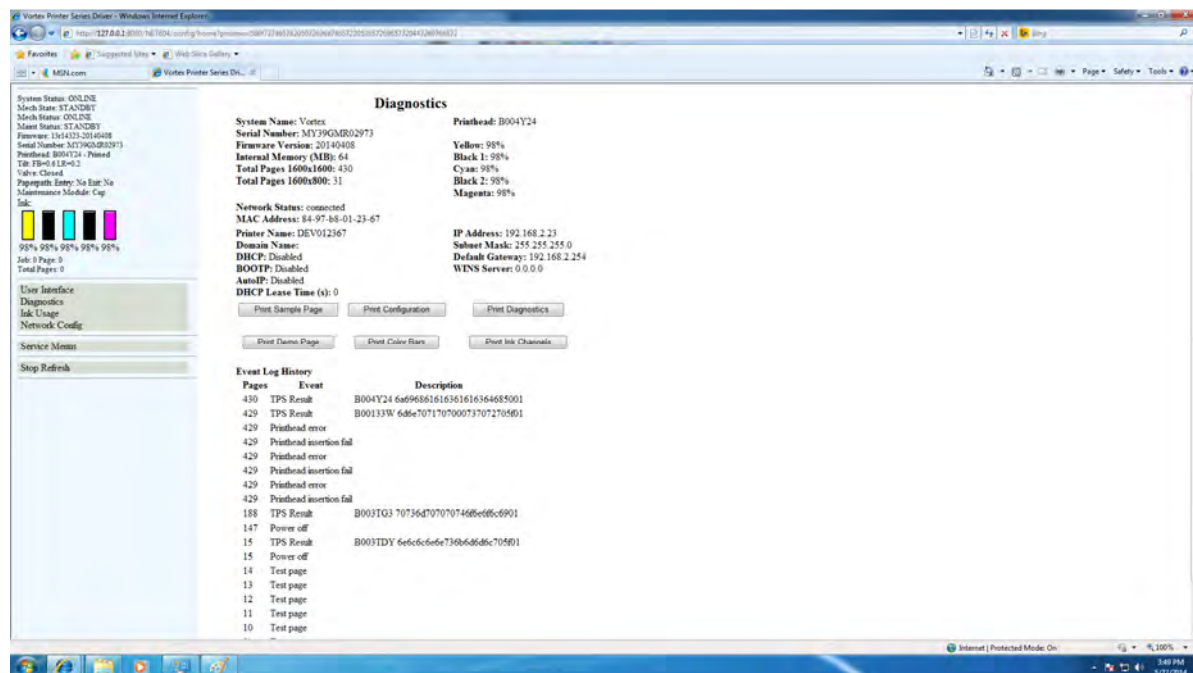
Print Diagnostic Page – Shows basic printer information, memory, Network Settings, Event Log and RAM partitions.

Print Demo Page – Prints Memjet Demo Page

Print Color Bars – Prints 7 color bar page to check color quality.

Print Ink Channels – Prints 5 color bar page (YBCBM) to check whether all color channels are working properly.

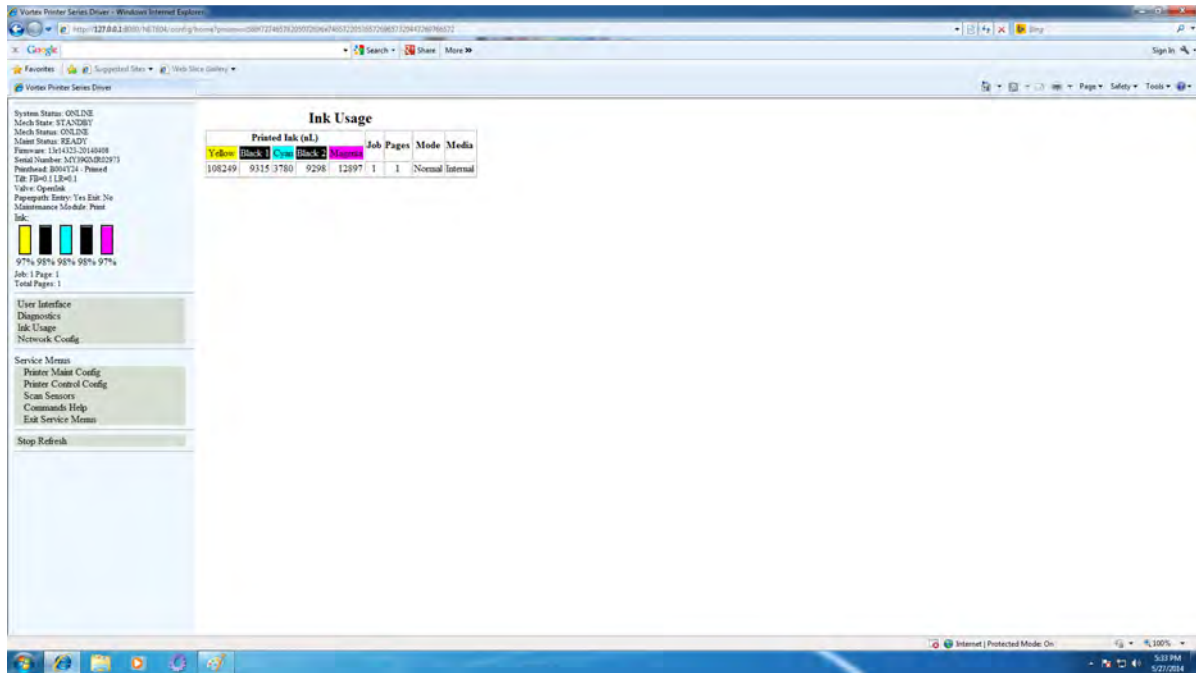
MAKE SURE YOUR PRINTER IS SET TO CONTINUOUS MODE AND YOU ARE USING CONTINUOUS MEDIA WHEN YOU ARE PRINTING THESE TEST/SAMPLE PAGES.



4.3. Ink Usage

Allows you to monitor the estimated amount of ink left in each of the five Ink Tanks. You can monitor ink usage and consumption and schedule Tank changes (saving down-time during a print run.)

NOTE – Ink Usage only works when you start with a new Tank and leave it in the Printer



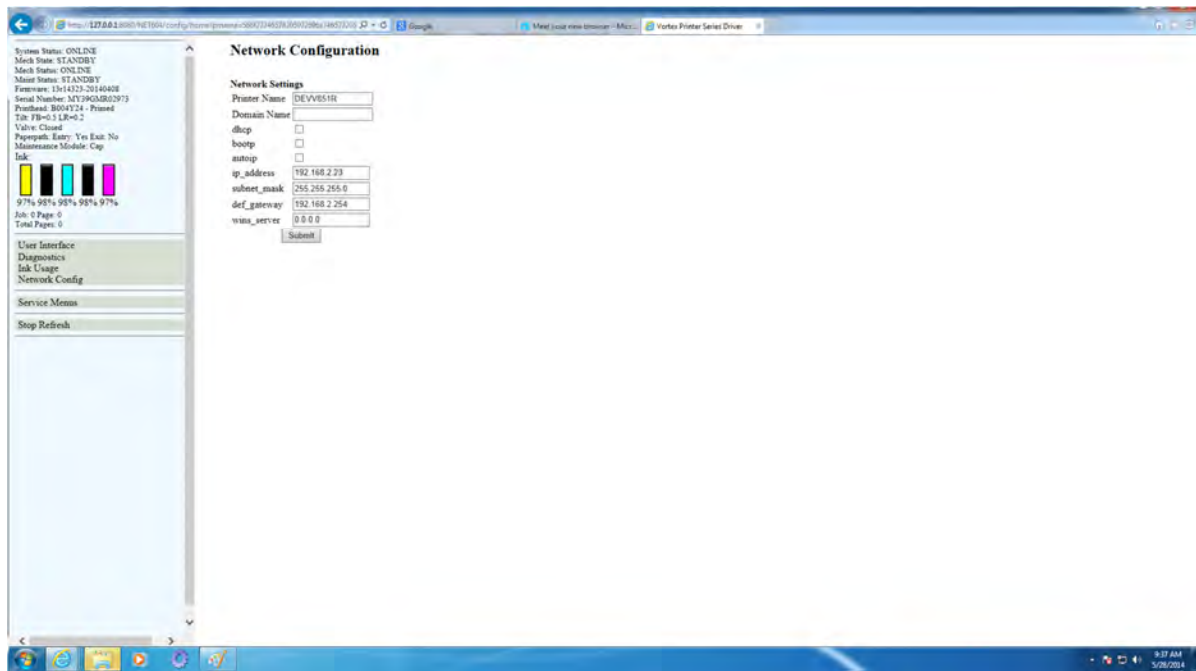
Please note that ink usage/job history will be lost after turning the printer down.

4.4. Network configuration

On this page you will see the actual engine network configurations. The network settings page provides information about the network connectivity, Printer name, Domain name, and IP configuration settings.

dhcp:-if its on then the machine will get an ip address from the router. This is the basic setting also.

Manually IP settings: turn off the dhcp and autoip and after type the chosen IP into the IP address line and press SUBMIT.



4.5.Service Menus

For authorized peronnel only. Provides acces to more advanced printer control and maintenance menus.

Under this menu you can find many basic engine settings. Very easy to uncalibrate the engine, this is the reason of the password protection.

Here possible change TOF,BOF, Cut, Gap, r2r distances, Tof2Tof settings. The driver also can handle the most of these parameters.

5. Maintenance Guide

5.1. Maintenance Overview

To ensure reliable operation and high print quality while using the product, the regular inspection and maintenance steps are required to be performed. These include mechanical subsystems checks, occasional cleanings, consumables changing and print head cleaning.

Cleaning

The most essential maintenance operation is automatic – cleaning the print head and preventing it from dehydration. The print engine performs various maintenance operations before and after print jobs and in the background. Normally manual print head cleaning is not required.

Regular checks

At regular intervals (say at the beginning of a shift or day) inspect that the maintenance station is in cap position, the cutter is not obstructed, the paper path is clean (there are no paper clippings present), sensors are not covered. Check that wires are not loose, there is no ink leaking.

If the operator detects print quality problems, check the troubleshooting part for steps to perform in order to solve the issues.

Consumable change

The main consumables in the printer are the ink and the print head. The most frequent user intervention during the life time of the printer is the ink cartridge and print head change.

When the printer is running out of a particular ink, the Toolbox will display a message on the screen specifying which tank is out of ink. Remove the empty tank and insert a new one and the printer will operate again as before.

NOTE: The printer is working only with all cartridges installed!

5.2. Standard Maintenance

General and periodic maintenance procedures are needed to keep the Print Engine in good condition. In anticipation of industrial applications, an extensive list of service parts are available for the printer. Please contact your Reseller for further details.

High volume usage and specific use cases/configurations may require more frequent maintenance.

NOTE: Repair and replacement tasks, are referred to qualified technicians! For some maintenance tasks it is better to remove the engine from the printer!

Use the table below to determine which maintenance task (inspection, cleaning, lubrication, or replacement, etc.) to perform at a given time period or usage interval. The following tasks are to be performed by the operator only with very basic supplies, no special tools are needed.

General Maintenance Tasks	Interval				
	Daily	Bi-weekly	Monthly	Annually	As Needed
Printhead (manual wipe)					Wipe
PPCA Contact Cleaning					Every PH Removal
IDS Fluidic Couplings					Every PH Removal
Aerosol & Debris Removal	Clean	Clean	Clean	Clean	Clean
Optical Sensors – Paper Path		Clean	Clean	Clean	
Wiper Inspection		Inspect	Inspect	Inspect	
Wiper Cleaning			Clean	Clean	
Waste Ink Absorber			Inspect	Inspect	Replace
Ink Tubing			Inspect	Inspect	
Lift Motor Gear			Inspect	Inspect	
Grit Rollers – Paper Path			Inspect	Clean	
Moving Parts – Motor Test				Test	
Maintenance Module				Clean	
Ink Tank Latches				Inspect	
Cutter				Inspect	

In order to avoid personal injury, always use appropriate personal protection when performing maintenance tasks

- Clothing protection
- Powder-free nitrile gloves
- Lint-free cloth wipes – It is critical that the wipes used be soft to avoid scratching the printhead, and lint-free to avoid contaminating the printhead.
- De-ionized (DI)/Distilled water (electronics grade) – Use only deionized or distilled water for cleaning the unit. Take care to avoid contaminating the printhead with cleaners, lubricants, or other chemicals.

WARNING! – Always power down the Print Engine before investigating any cable connections! The printer runs off a 24-volt DC supply. Although this is considered low voltage, the current is sufficient enough to cause injuries.

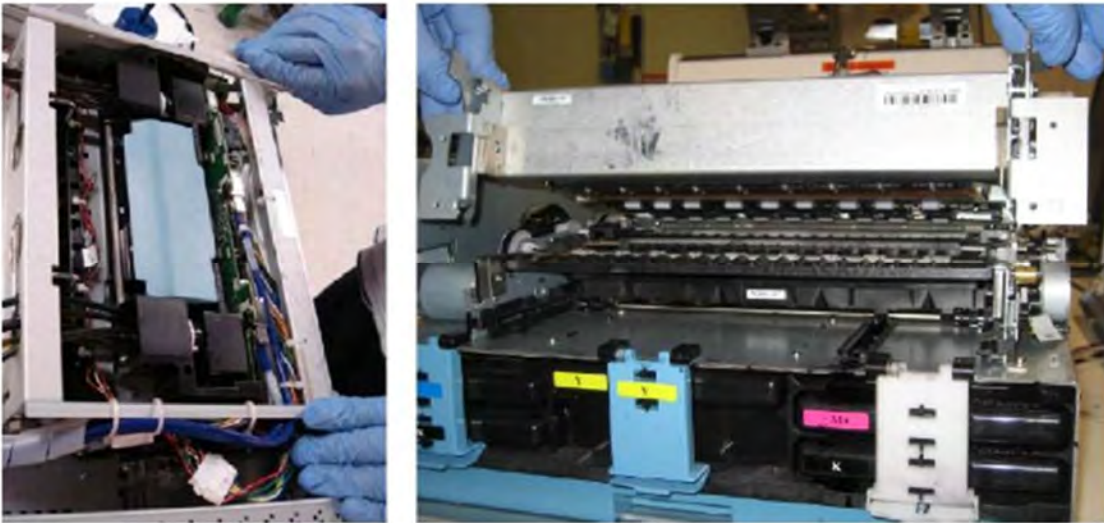
5.2.1. Daily Maintenance Tasks

Aerosol and debris removal

Ink may transfer from printer components into media path. Remove excess ink and debris daily to ensure optimal printing.

NOTE: If the operator finds paper debris on a starwheel, check to see whether or not it is aligned with the edge of the media. If so, you may need to adjust the paper guide and margin so that the starwheel no longer rubs the edge of the paper.

1. Perform this procedure with the printer powered on, so the platen is raised.
2. Pinch the clamshell latches to release, as shown on the pictures. Open the clamshell and allow the upper portion to rest on the hard stops.



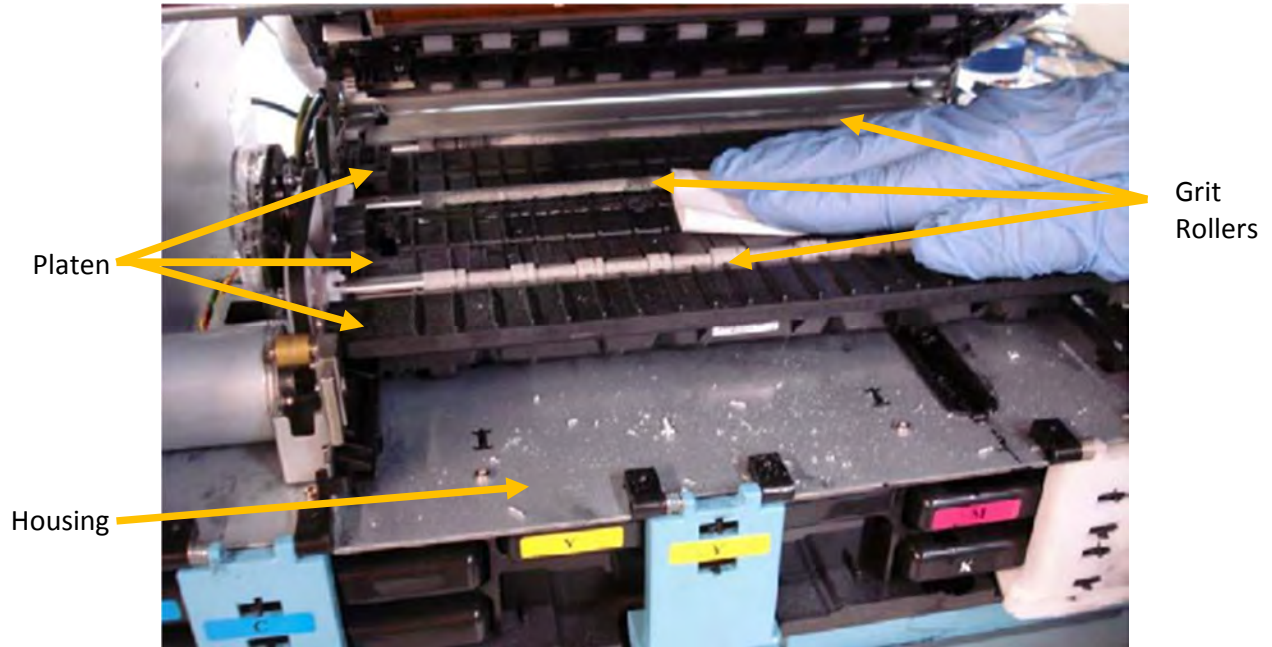
Picture of the clamshell opening procedure



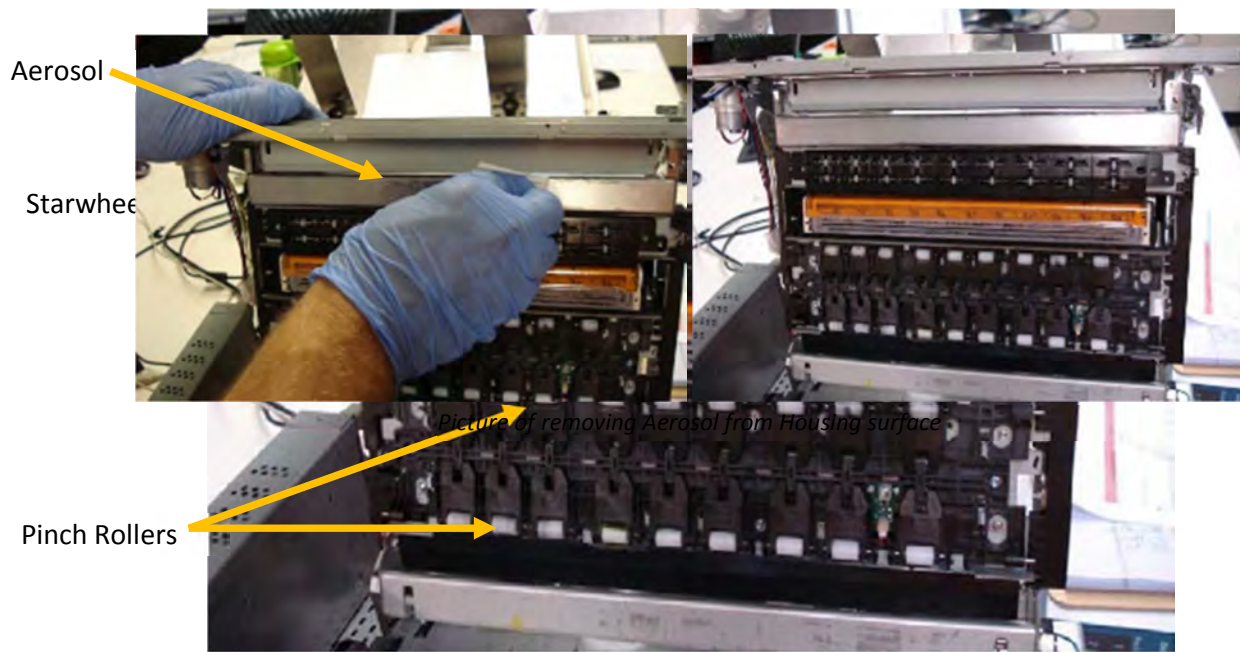
Picture of the opened Clamshell

3. Dampen a lint-free cloth with distilled water.
4. Wipe the system components and paper path surfaces (upper and lower), with a clean, damp lint-free cloth, to remove ink overspray (aerosol) and debris.

- NOTE:** Do not wipe the starwheels as they may release and fall out. Do not clean the printhead nozzle plate at this time; it will be cleaned during another task.
5. Use a clean, dry lint-free cloth dry the inside of the unit. Avoid the grit rollers since they can snag on the cloth and create debris.

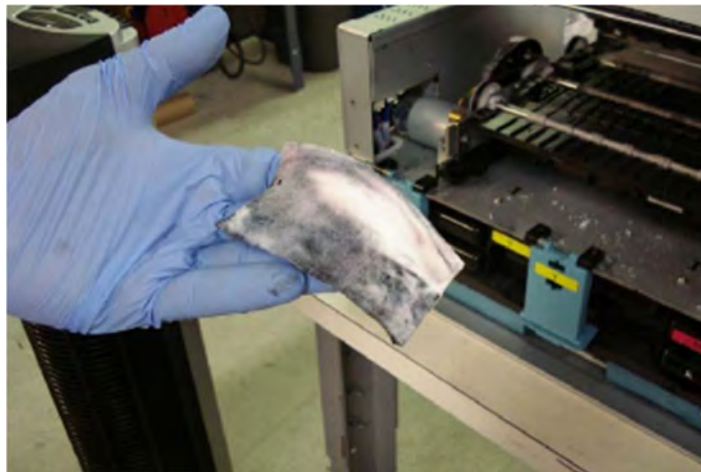


Picture of the Wipe Lower Surfaces



Picture of the Wipe Upper Surfaces

6. Fold the cloth between wipes to ensure a clean, uncontaminated surface is used each time.



7. Use a vacuum cleaner if necessary to remove debris inside and outside surfaces of the clamshell.



5.2.2. Bi-Weekly Maintenance Tasks

Aerosol and debris removal

- Paper path optical sensor cleaning
- Wiper inspection

Aerosol and debris removal – see at daily maintenance tasks

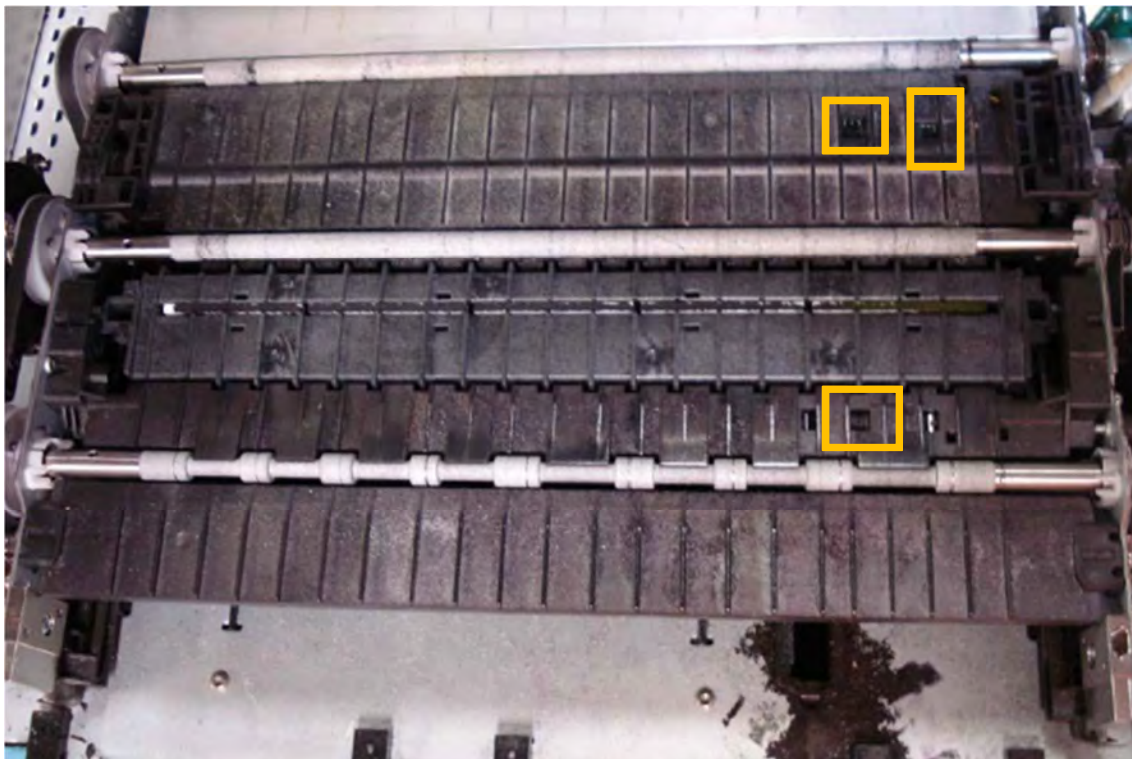
Optical Sensor Cleaning

Clean the four optical sensors in the paper path every two weeks.

1. Pinch the clamshell latch to release and open the clamshell.



Picture of Paper Path Optical Sensor Locations - Top



Picture of Paper Path Optical Sensor Locations - Bottom

2. Moisten a foam swab with distilled water.



3. Place the damp swab on each sensor and twist back and forth to clean the surface. Use a new, moist swab on each sensor.



4. Repeat cleaning and drying process for all four sensors.

Wiper Inspection

1. Pinch the clamshell latches to release and open the clamshell.



NOTE: The wiper is automatically in the up position when the clamshell is open.

2. Go to Toolbox and click on 'Eject Service Station' button.
3. Inspect the wiper to ensure that it spins freely with no excessive noise
4. Check the surface of the microfiber roller (MFR) for any irregularities (bumps, divots, etc.) or delamination (peeling of the wiper surface at the seam). If irregularities are seen, escalate to a technician for replacement.
5. Use tweezers to remove any large clumps of debris.

5.2.3. Monthly Maintenance Tasks

- Aerosol and debris removal
- Paper path optical sensor cleaning
- Wiper inspection
- Waste ink absorber inspection
- Ink tubing inspection
- Lift motor gear inspection
- Paper path grit roller inspection

Aerosol and debris removal; Paper path optical sensor cleaning; Wiper inspection – see at bi-weekly maintenance tasks.

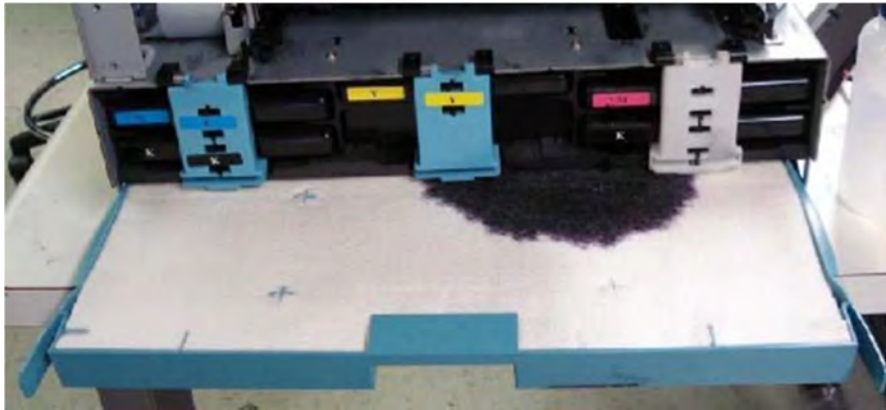
Waste ink absorber inspection

Waste ink absorber must be inspected every month. The waste ink absorber was designed to last the life of the printer under normal printing conditions.

1. Release the waste ink tray latches at the front of the unit and slide the tray out.



2. Even the absorber is completely darkened with waste ink, with no white showing, it may still be able to hold additional ink due to evaporation. The capacity of the waste ink absorber is 1.6L. Visually inspect the waste ink absorber and tray to see if there is ink leaking out of the tray. If yes, replace the absorber with a new one.



3. Slide the waste ink tray back into the frame until it clicks.

Ink Tubing Inspection

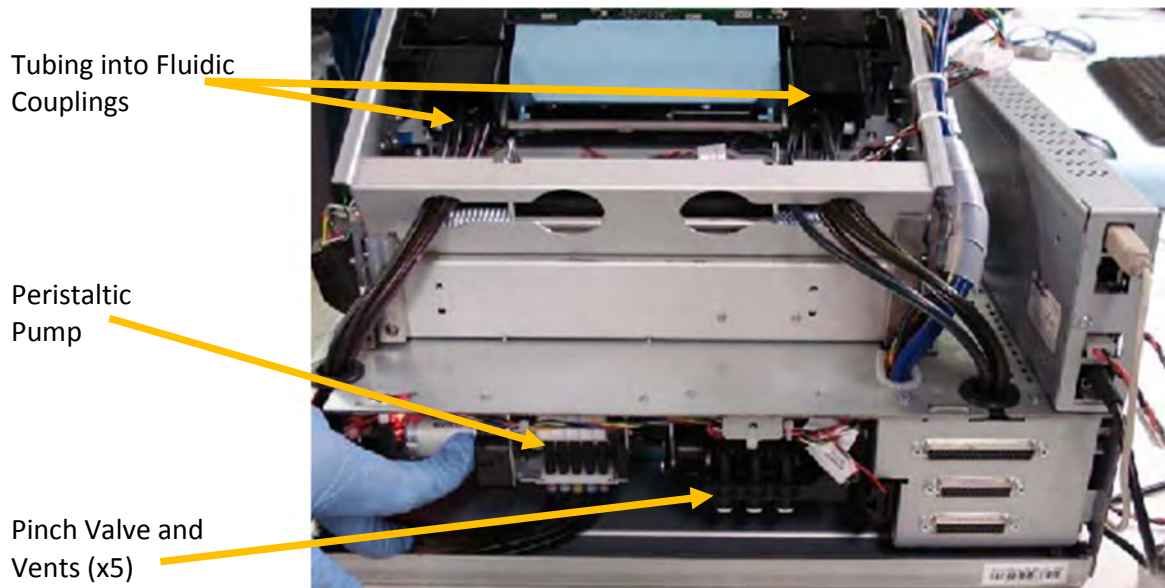
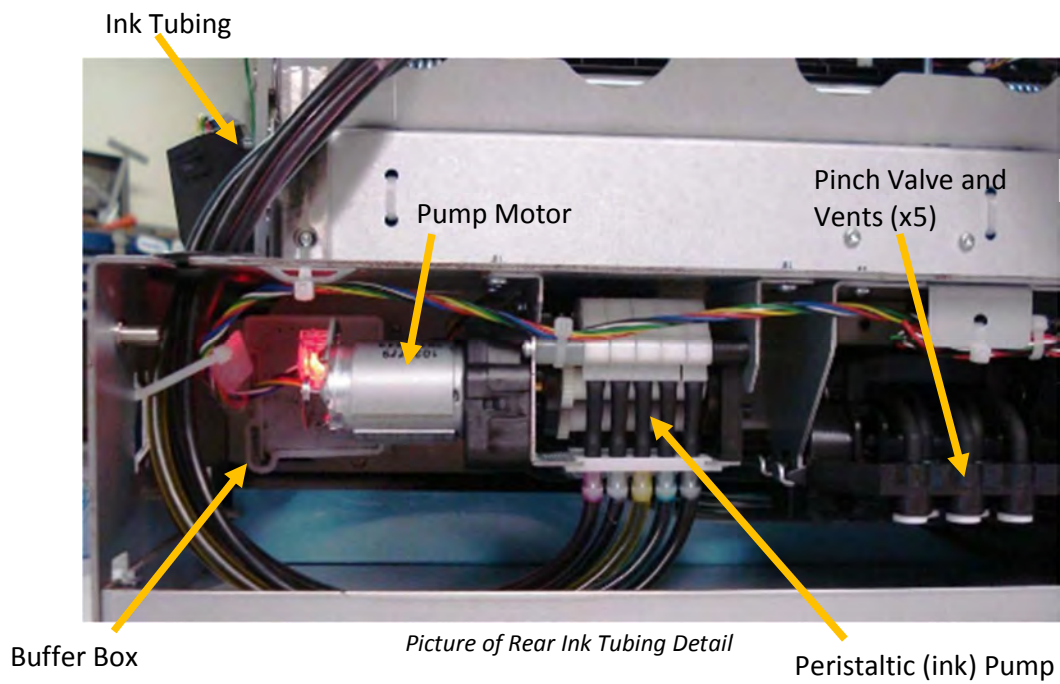
The following ink tubing and connections, visible to the operator, must be inspected every month:

- Fluidic coupling (aka Revolver Caps)
- Buffer box
- Pinch valve
- Peristaltic (ink) pump

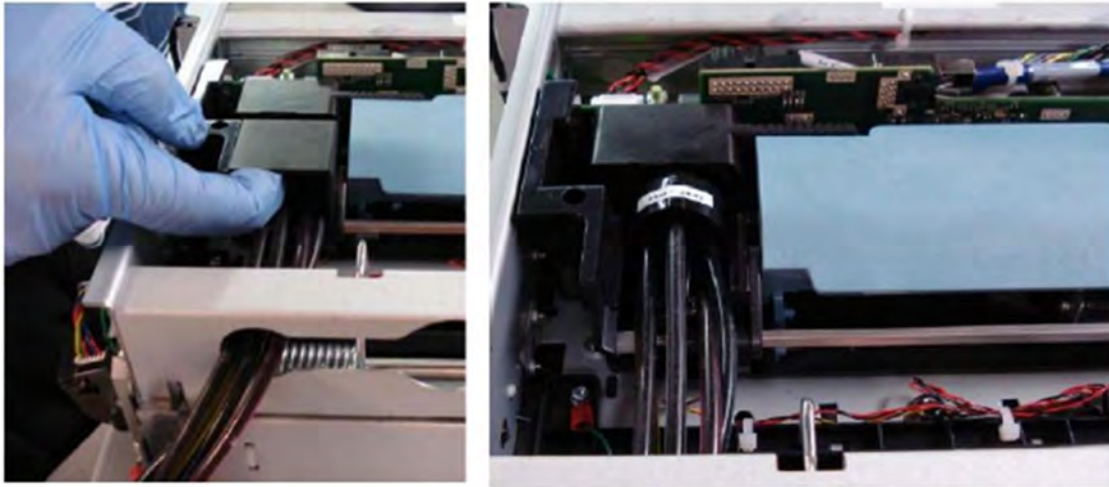
Refer to the following pictures to identify the specific hardware.

1. Remove any housing or covers positioned around the ink tubing.

NOTE: The clamshell should be closed during this procedure.



Use a finger to gently pry both fluidic coupling covers off in order to inspect the ink tube connections underneath.

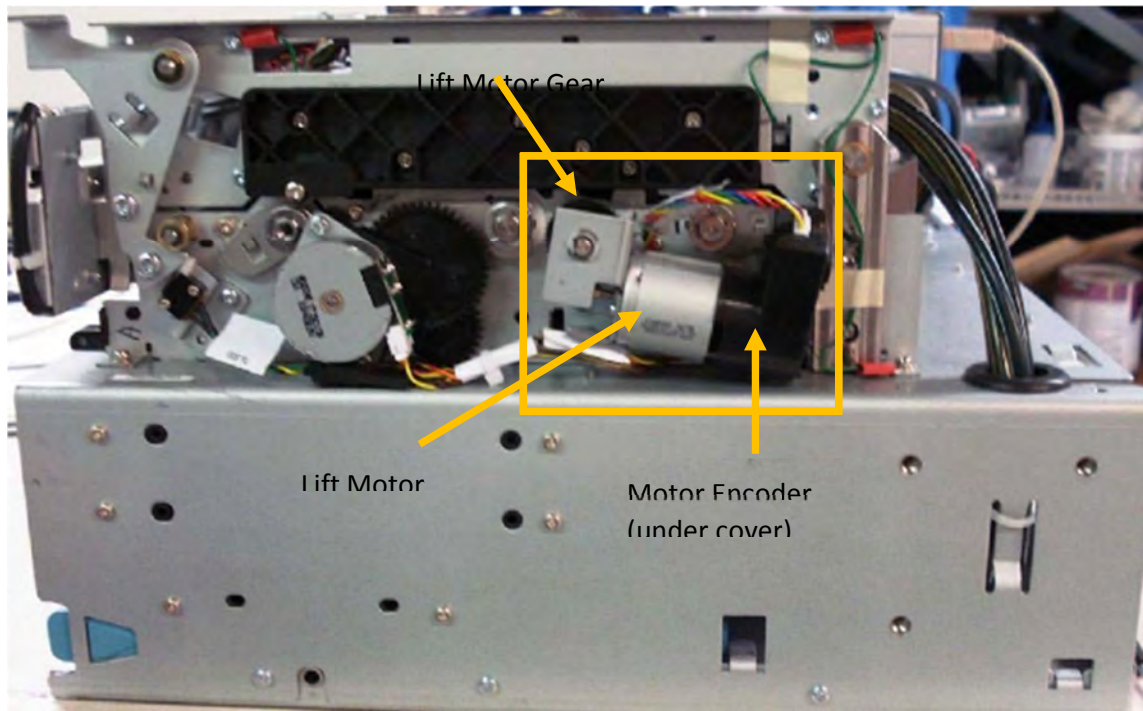


Picture of Remove Fluidic Coupling Covers

2. Visually inspect each tubing connection point for leaks. If leaks are found, escalate to a technician for troubleshooting.
3. Follow the exposed length of each tube and visually inspect each ink tube for kinks or pinches in the tubing. Undo the irregularity to allow ink to flow freely. Escalate to a technician if leaks result.
4. Re-install the fluidic coupling covers.
5. Re-install any housing removed to access this area.

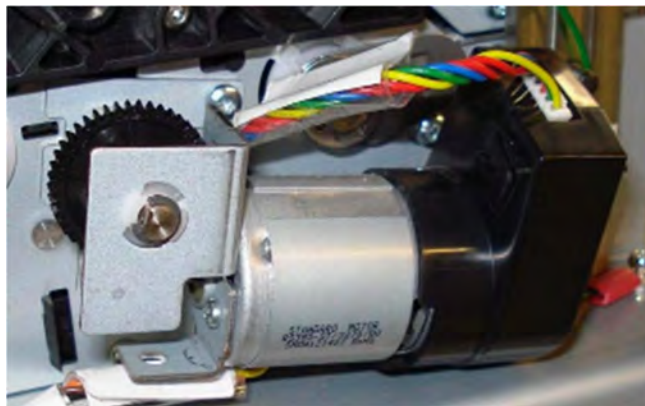
Lifter Motor – Gear Inspection and Encoder Cleaning

The lift motor gear, on the right side of the unit, must be inspected every month.



Picture of the Lift Motor Assembly Location

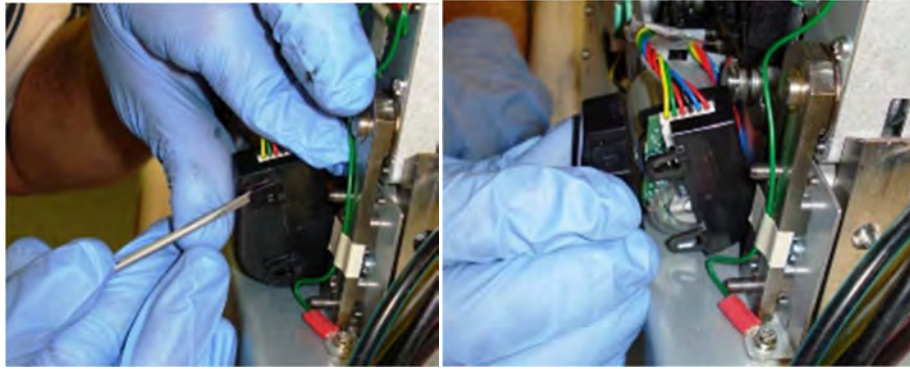
1. Inspect the lift motor gear for general wear (worn teeth, debris, etc.). Remove any debris found. If excessive wear is observed, escalate to a technician for repair.



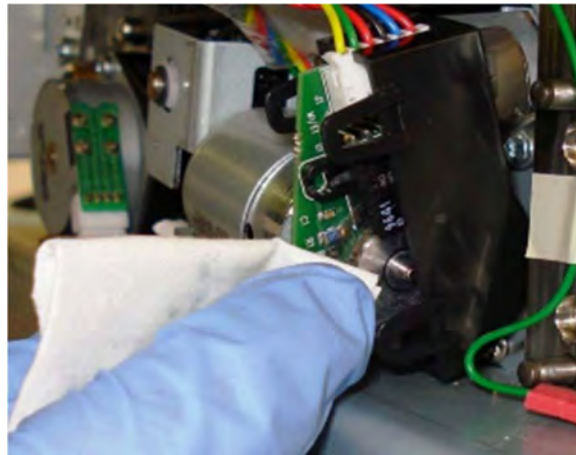
Picture of the Lift Motor

2. Use a lint-free wipe, dampened with DI water, to **very** gently clean exposed encoders. Gently rotate the encoder after each wipe to ensure cleaning of the entire surface.

NOTE: On some printers there is a cover on the lift motor encoder that protects it from aerosol and debris. No cleaning is required on these units.



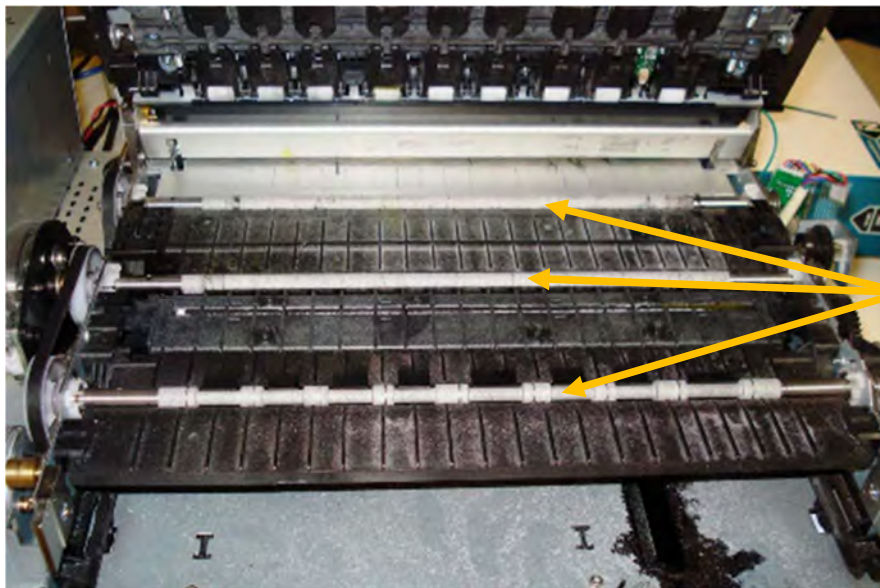
Picture of removing the Lift Motor Encoder Cover



Picture of cleaning the Lift Motor Encoder

Paper Path Grit Roller Inspection

The three paper path grit rollers must be inspected every month.



Grit
Rollers

Picture of Grit Rollers

1. Inspect the print rollers for ink residue and debris. If none is found, proceed to the next PM task. If residue is seen, perform the following steps to remove it.



Picture of Grit Rollers with residue

2. Lightly moisten a toothbrush with a small amount of DI water.
3. Gently scrub the grit rollers to remove any ink or paper dust. Manually rotate the rollers to ensure that they are completely clean.
4. Use a shop towel to dab the rollers and remove any excess moisture. Do not rub the towel back-and-forth or fibers will be left on the grit rollers.

5.2.4. Annual Maintenance Tasks

Perform the following maintenance procedures once a year:

- Aerosol and debris removal
- Paper path optical sensor cleaning
- Wiper cleaning
- Waste ink absorber inspection
- Ink tubing inspection
- Lift motor gear inspection
- Paper path grit roller inspection
- Moving parts (motor test)
- Maintenance Module sled assembly cleaning
- Paper dust removal
- Ink tank latch/ink bay inspection
- Cutter inspection

Aerosol and debris removal; Paper path optical sensor cleaning; Wiper cleaning; Waste ink absorber inspection; Ink tubing inspection; Lift motor gear inspection; Paper path grit roller inspection – see at monthly maintenance tasks.

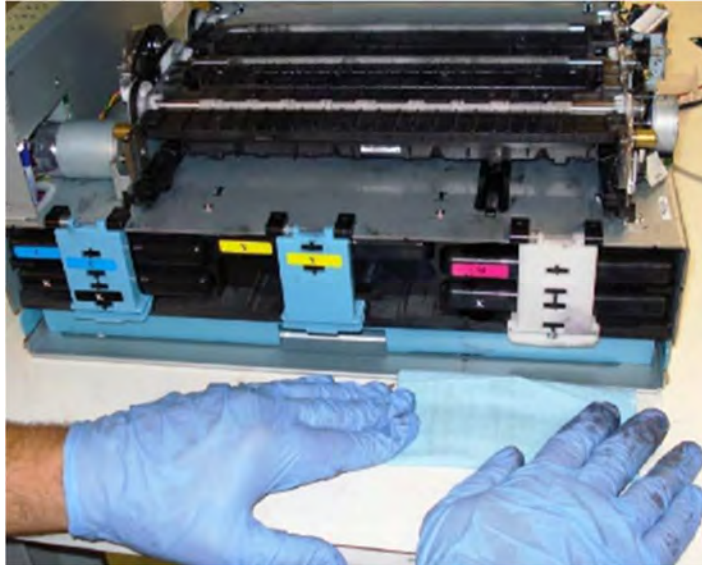
Moving Parts Motor Test

1. Activate the media path, cutter, pump, pinch valves, and maintenance module and listen for any noises not present when the printer was new.
2. Inspect the motion of the media path and the maintenance module to ensure the motion looks smooth and free.

Maintenance Module Cleaning

Clean the Maintenance Module (aka Service Station) every year.

1. Lay absorbent disposable towels under the base of the printer.



Picture of layed towels

NOTE: it recommended to do a System Deprime before ejecting the Maintenance Module. Also it is better to remove the printhead and cap it to avoid contamination and adequate moisture.

2. In the Toolbox push 'Eject Service Station' button to send the Maintenance Module to the eject position.

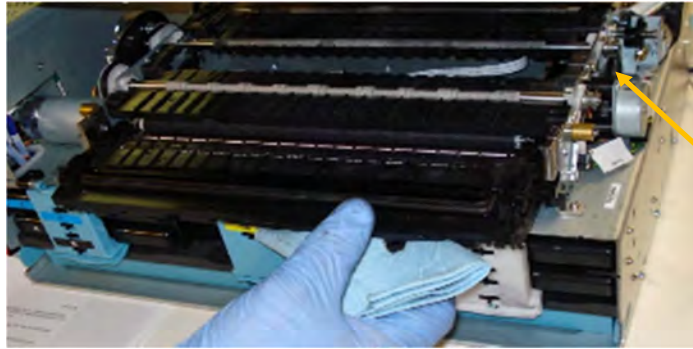
The maintenance module moves forward for easy access.



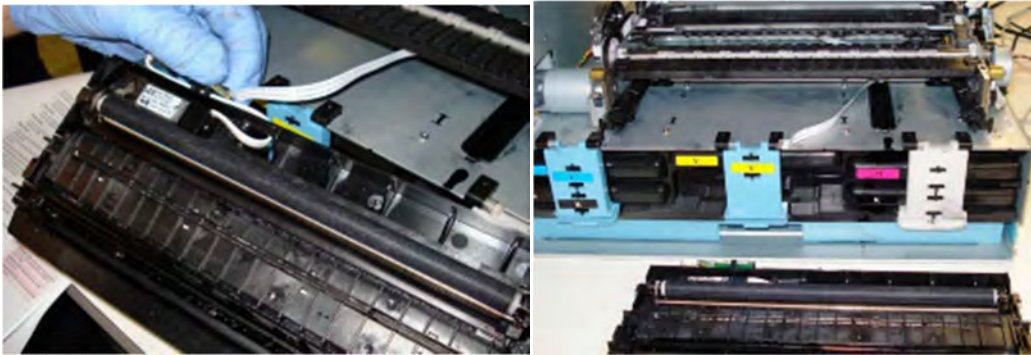
Maintenance Module in Forward Position

3. Prepare a large absorbent towel to catch any ink which might leak from the maintenance module or the wick to the waste ink reservoir. Make sure to fold the towel over 2 or 3 times so that it can absorb lots of ink. Be prepared to cover the bottom of the maintenance module with the towel as you pull it out.

Manually rotate the maintenance module positioning gear until the module disengages from the drive gear and gently pull the module forward until you can disconnect it from the translation motor.



4. Disconnect the ribbon cable connector for the wiper motor to free the MM.



Picture of disconnecting MM from Wiper Motor

5. Use a lint-free cloth, moistened with DI water, to gently remove any ink residue or debris from the Maintenance Module. Once the lint-free cloth is soiled, use a new cloth.



Picture of Ink Residue removal from the Maintenance Module

6. Inspect both wicks (printing platen and cap) for warping, plugged up sections, or to see if it is falling out. If fouled, escalate to a technician for replacement with new wick(s).

7. Inspect the cap for ink contamination and cracking or permanent deformation of the cap. If permanently damaged, escalate to a technician for replacement.



Picture of wiping the Cap Seal with damp lint-free cloth

8. Inspect the wiper module components for damage or permanent deformation. If permanently damaged, escalate to a technician for replacement.
9. Remove the paper dust from underneath the maintenance module, during the annual cleaning. Use a vacuum cleaner for the interior of the unit, if necessary.



Picture of using a Vacuum cleaner to remove debris from under the MM

Wiper cleaning

Wiper cleaning usually means that the operator has to change the microfiber roller as it comes to the end of its lifetime. The operator can easily recognize this stage. First of all the shape of the roller turns from rounded to ellipse. Secondly this change within the shape will cause significant noises during maintenance.

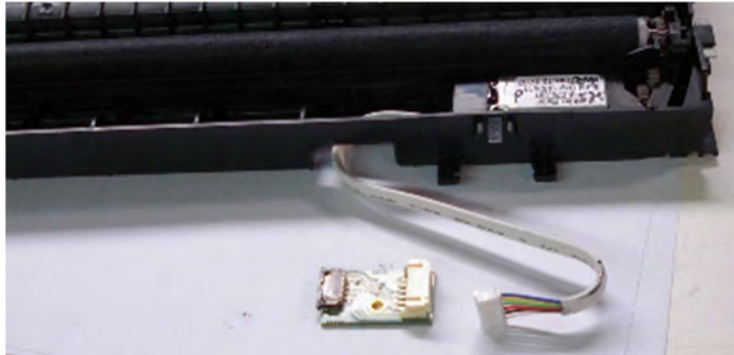
NOTE: Lifetime of the wiper roller depends on the usage, but should be change at least twice a year.

1. Disconnect the wiper motor connector PCB from the mounting clip.



Picture of disconnecting wiper PCB from Wiper Housing

2. Disconnect the wiper PCB from the ribbon cable, as shown in the figure below.



Picture of disconnecting Wiper PCD from ribbon cable

3. Route the ribbon cable through the housing to free the wiper, as show non the next pictures.



Picture of routing ribbon cable through housing

4. Flip up the retention tab at each end of the wiper assembly to free the microfiber roller.

Retention
tab



Picture of removing the MFR after opening retention tabs

5. Remove the MFR to access the transfer roller (TR) that is installed below the MFR in the wiper module assembly.

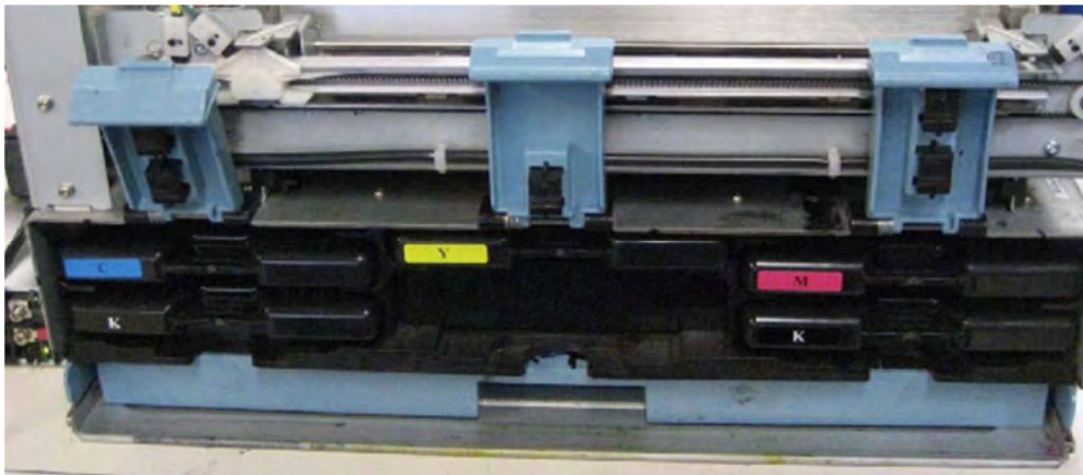


Picture of Transfer Roller (TR)

6. Visually inspect the transfer roller (TR) for unusual ink accumulation. The transfer roller is stainless steel. Ink may accumulate in scratches on the roller. Wash the roller with damp lint-free cloth if necessary.
7. Re-assemble the wiper module.
8. In Toolbox press 'Home Service Station' button to re-install the MM into the print engine.

Ink Tank Latches Inspection

1. Release the three ink tank latches.



Picture of released ink tank latches

Carefully slide all five ink tanks, one at a time, out of the unit.



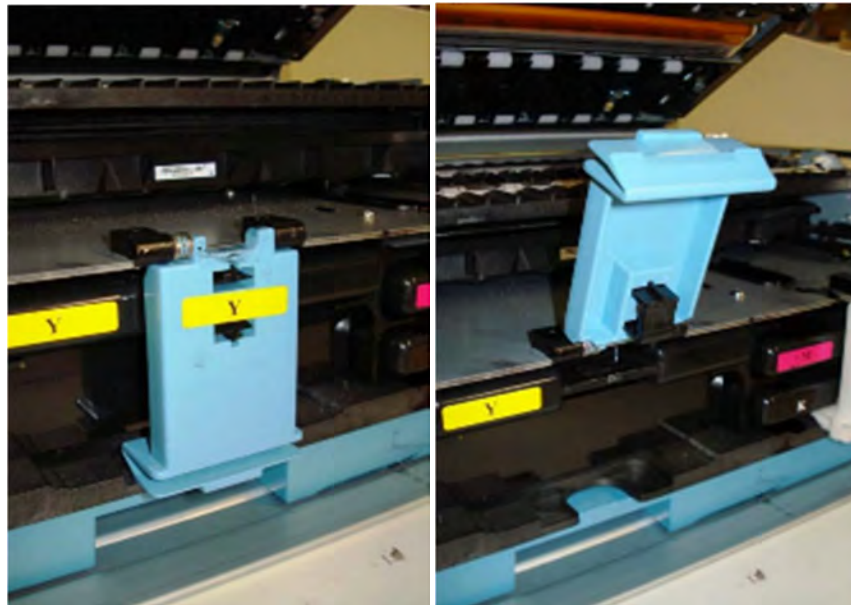
Picture of removed Ink Tanks

2. Verify that Toolbox reflects the tank removal.
3. Align each ink tank with the rails on the printer and insert. Repeat until all five ink tanks are re-installed.



Picture of re-installing Ink Tanks

4. Re-fasten each ink tank latch to ensure it moves properly and engages fully. If not, escalate to a technician for replacement.

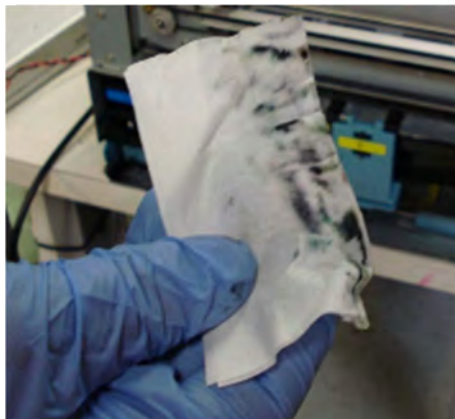


Picture of opened and closed Int Tank Latch

5.2.4.1. Cutter Inspection and Cleaning

WARNING! – To avoid personal injury, power off the printer before performing this task!

1. Fold a damp lint-free cloth and insert it into the groove beneath the cutter



Pictures of cleaning the Cutter

2. Wipe back and forth to remove aerosol and debris
3. Remove any media debris from the cutter with tweezers.

5.2.5. As Needed Maintenance Tasks

The following general maintenance tasks should be performed on an as needed basis, based upon inspection during every day use and/or when performing other tasks.

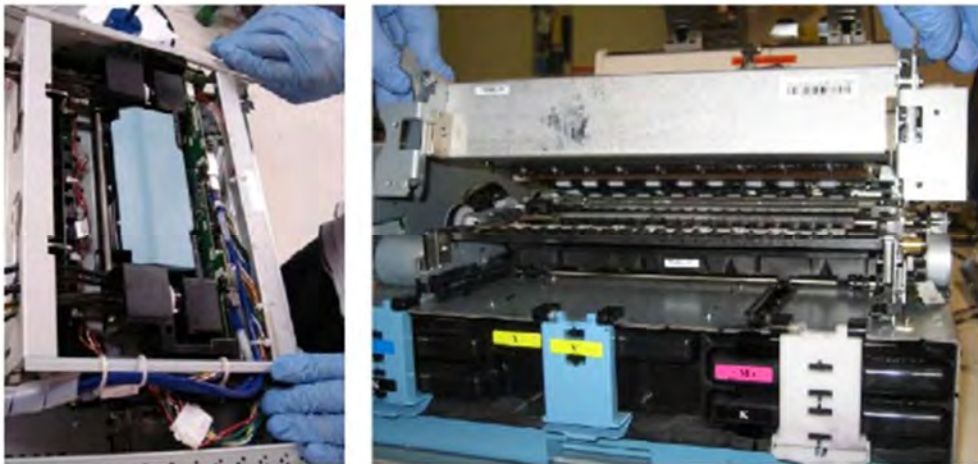
The printhead cartridge should be manually wiped after the following occurrences:

- after paper jams
- before re-installing an used printhead cartridge into the print engine
- if print quality is showing signs of contamination
- if automated maintenance algorithms prove ineffective for nozzle recovery. There are two methods for cleaning the print head cartridge; one with it installed and one with it removed from the unit. Both methods are listed below. When removing and reinstalling an used printhead or when replacing a printhead, use the second method.

Printhead Cartridge Cleaning (Manual Wipe While Installed)

Perform the following steps to ensure proper printhead cleaning without removing it:

1. Pinch the clamshell latches to release. Open the clamshell and allow the upper portion to rest on the hard stops.



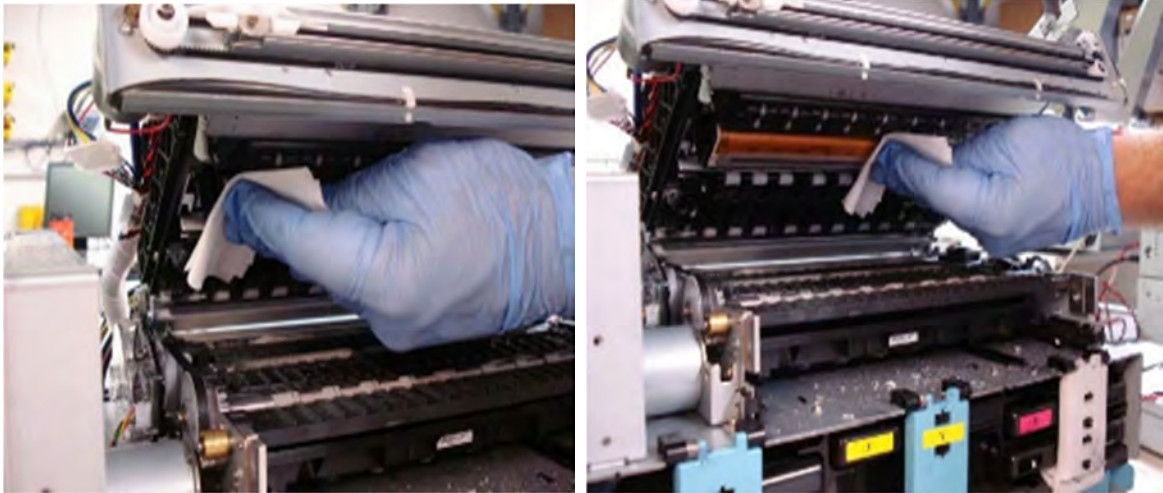
Picture of opened Clamshell

2. Locate the printhead nozzle strip.



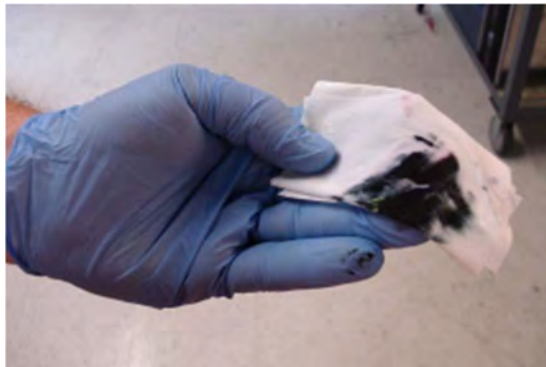
Picture of Printhead Nozzle Plate

3. Dampen a lint-free cloth with distilled water
4. Gently wipe the print nozzle plate from one end to the other



Picture of wiping the nozzles

5. Fold the cloth and clean the nozzle plate again to remove remaining debris.



Pictures of soiled lint-free cloth

Close the clamshell.

Printhead Cartridge Cleaning (Remove Cartridge)

Preparation

1. Lightly dampen a lint-free cloth with DI water.
2. Set the wipe on a clean surface.
3. Lightly moisten the cloth strip in a PH shipping cap with a small amount of DI water and set aside.



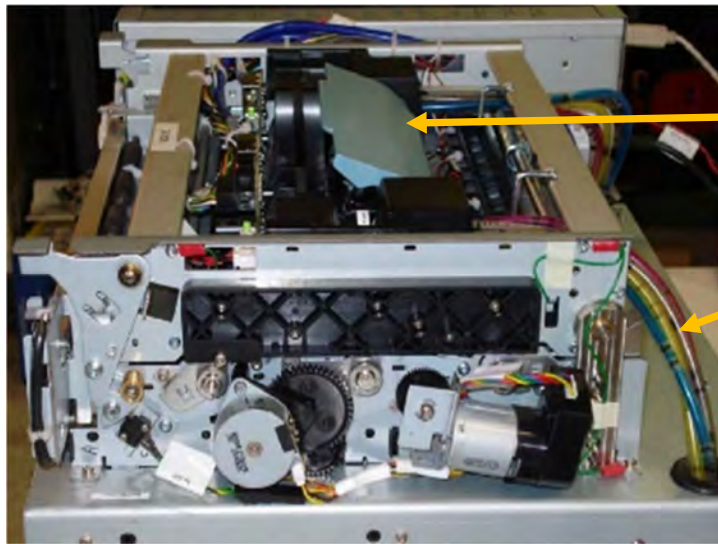
Picture of moisten PH Cap

Perform the following steps to ensure proper printhead cartridge cleaning:

4. Open the toolbox and press system deprime. This command will de-prime the system. During de-priming, the printhead latch will release. Listen for the latch to click and observe that it is "popped up" when release is successful.



Picture of released PH Latch

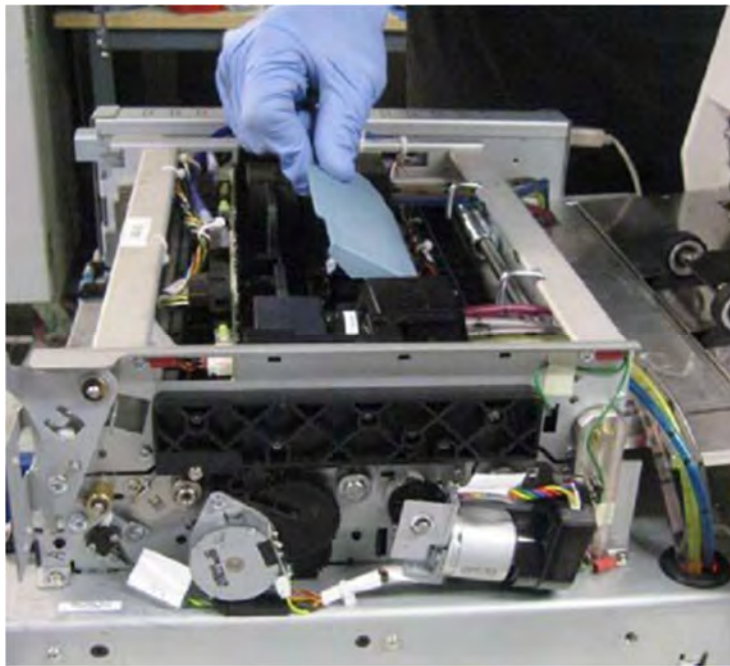


Latch popped up

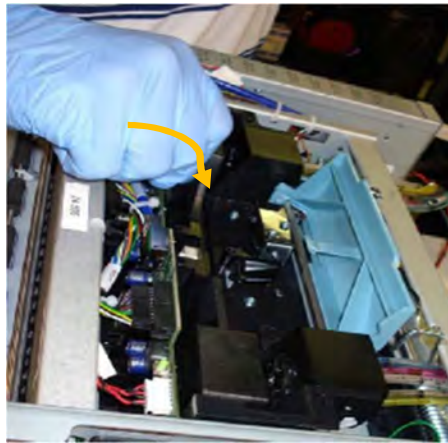
Ink backs out of tubing
during deprime

Picture of released Latch and empty ink tubes

5. Open the latch.

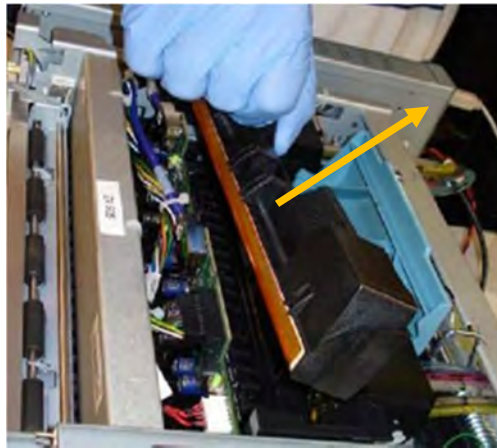


6. Tilt the printhead cartridge towards the rear of the unit until it clicks.



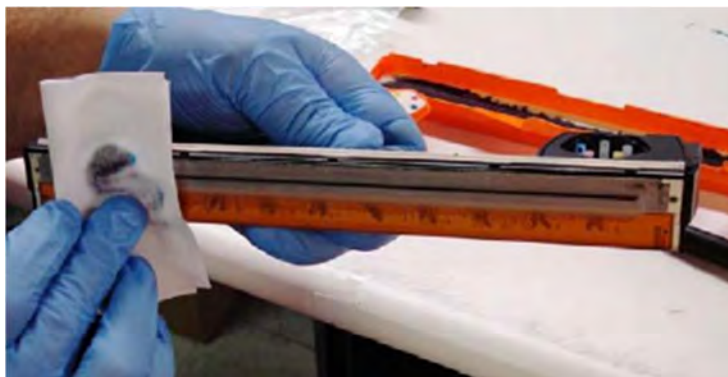
Picture of tilting PH towards rear of the unit

7. Slide the printhead cartridge out of the print engine.

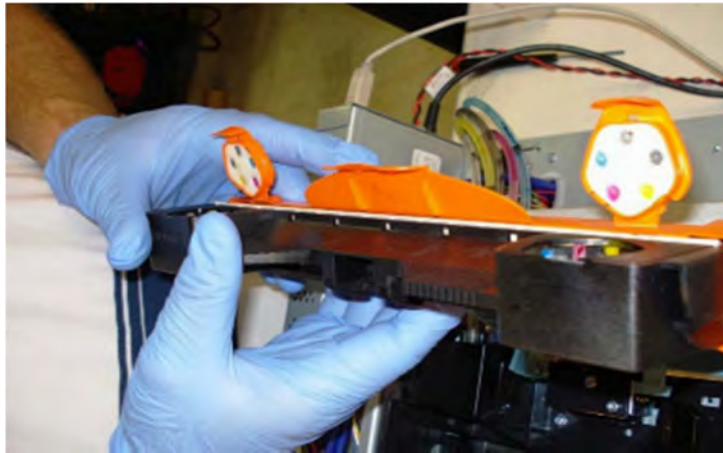


Picture of sliding the PH out of the unit

8. Gently wipe the printhead from one end to the other, with a lint-free cloth moistened with DI water, and then cap the printhead to keep it moist while performing other tasks.



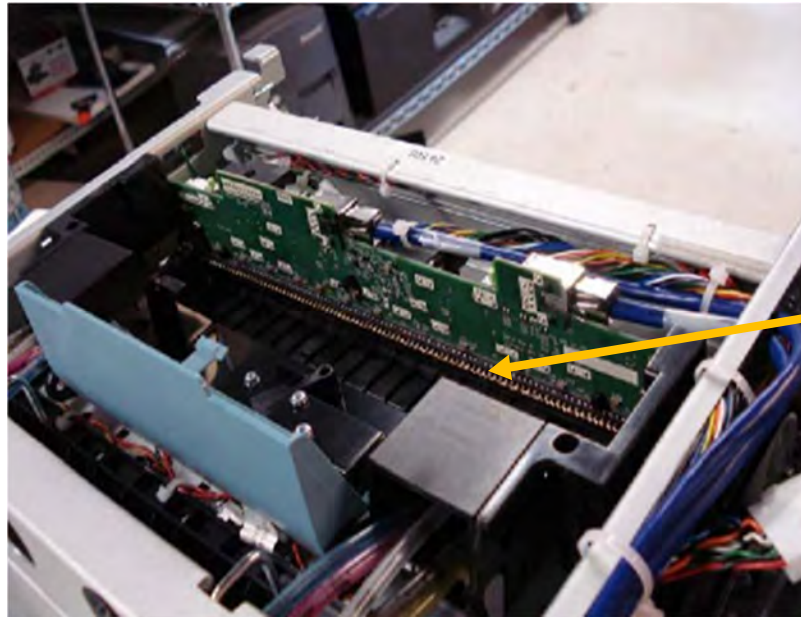
Picture of wiping PH nozzle strip



Picture of capping the PH

NOTE: Each time the printhead is removed, clean the PPCA contacts and fluidic couplings!

9. Locate the PPCA contacts.



Picture of PPCA Contacts

10. Use a new, lint-free cloth dampened with DI water to gently wipe up-and-down to clean the PPCA contacts.

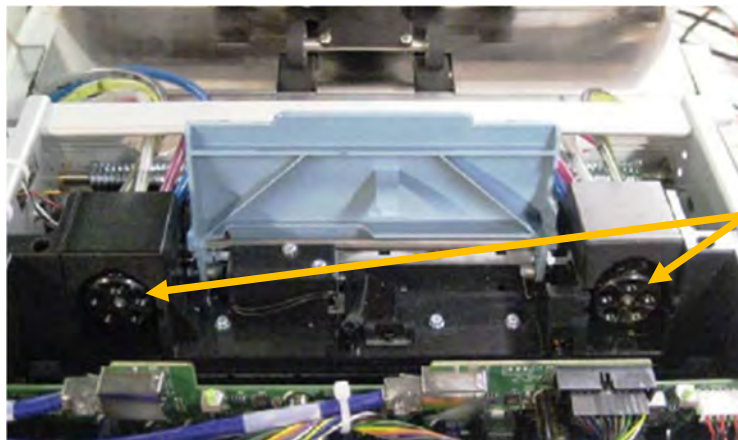
CAUTION

Use only a very gentle up-and-down motion (never side-to-side) because the contact pins are very easy to bend which can damage the printhead and the printhead circuit board!



Picture of cleaning the PPCA Contacts

11. Locate the fluidic couplings.



Fluidic Couplings

Picture of Fluidic Coupling Location



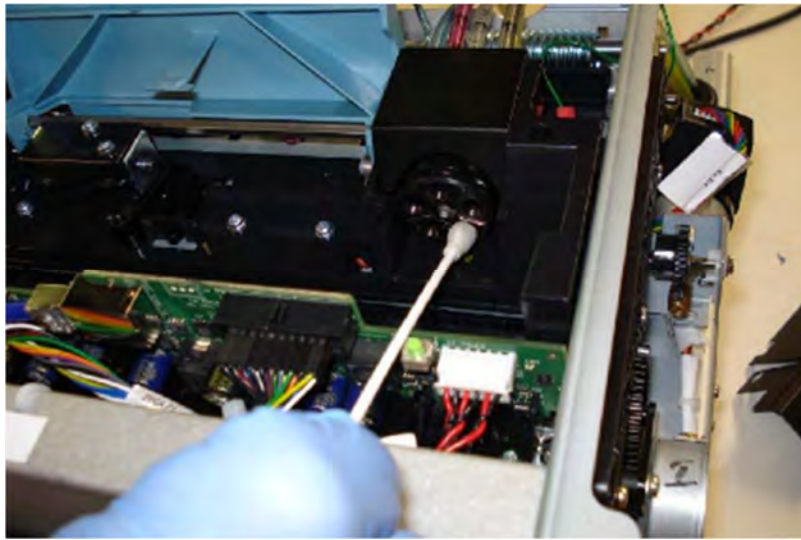
Picture of Fluidic Coupling with ink residue

12. Moisten a foam swab with DI water.



Pictured of moisten swab

13. Place the foam swab in one of the ink channels on the fluidic coupling and rotate to clean.



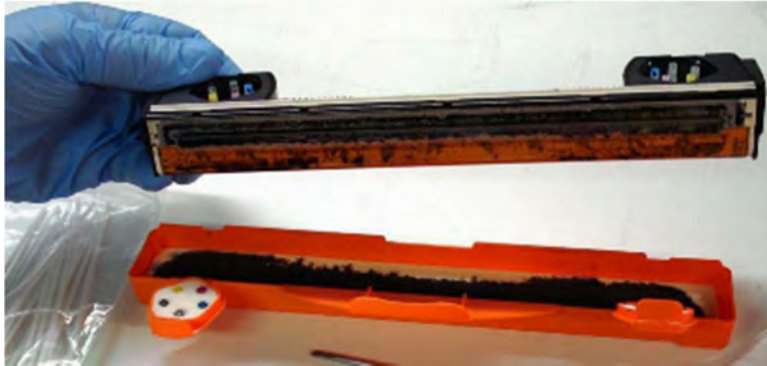
Picture of cleaning the ink channel

14. Use a new, moist foam swab and repeat the process for each ink channel on both fluidic couplings until all 10 openings are cleaned.



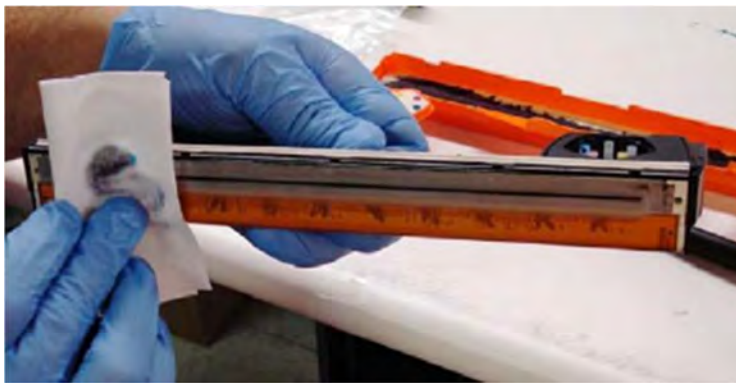
Picture of soiled swab for one fluidic Coupling (5-channels)

15. Remove the cap from the printhead



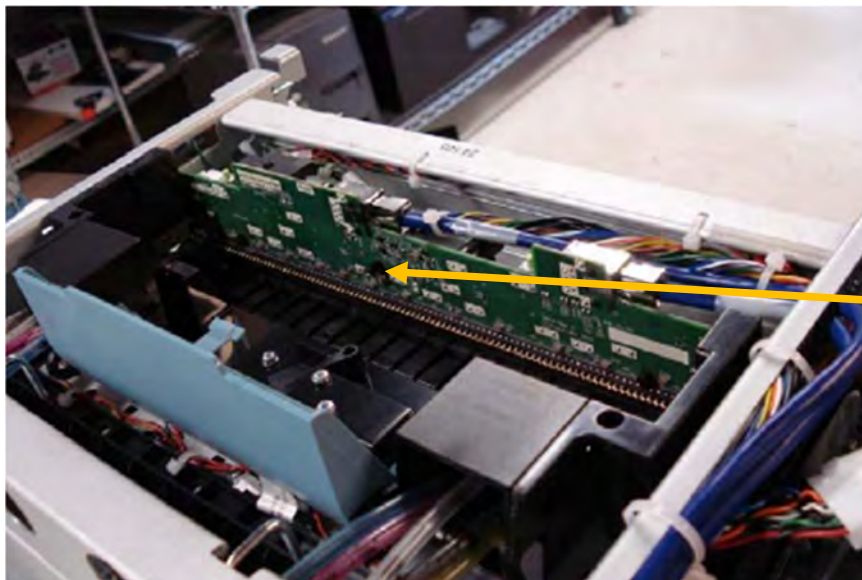
Picture of uncapping the PH

16. Wipe from one end to the other with the damp lint-free cloth.



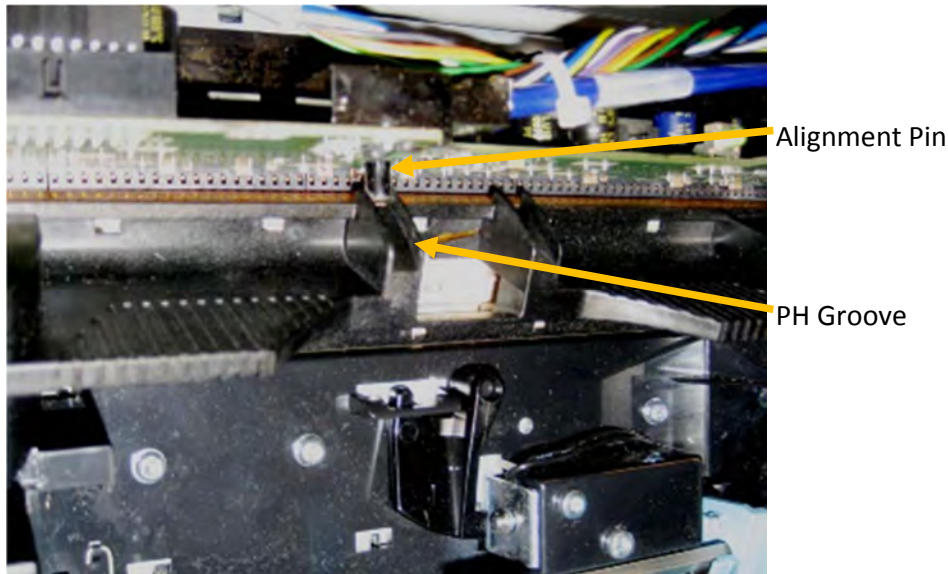
Picture of wiping the PH

17. Align the PH cartridge with the pin on the PPCA board and slide it into the print engine.



PH Alignment
Pin

Picture of PH alignment Pin



Picture of PH alignment pin interface

18. Tilt the top of the printhead cartridge toward the back of the printer, about 20°.
19. Gently seat the back of the printhead cartridge into the print engine.
20. When the back of the printhead is firmly seated, gently rotate the printhead cartridge into position against the stops on the printhead connector board until it clicks into place.

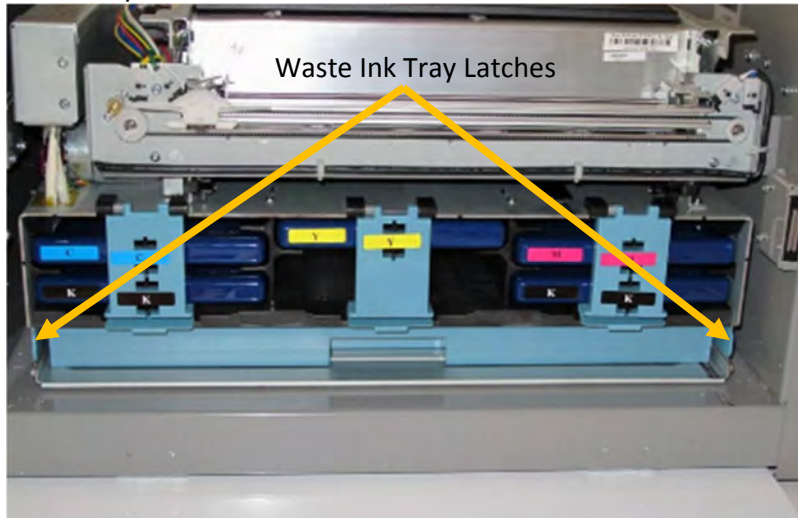
CAUTION
If the printhead will not rotate into position, do not force it!

21. Slowly close the printhead latch. The fluidic couplings will advance and seal to the printhead cartridge.
22. Close the printhead latch. When the printhead latch is closed, the printer will prime, clean and cap the printhead automatically. This operation will generally take a minute or two, and will be apparent from sounds emanating from the print engine. If the engine don't start it automatically, then open the toolbox and press the system prime.
23. When the system is primed, print a test printjob from Toolbox to make sure the cleaning process was right and the printhead is working properly.

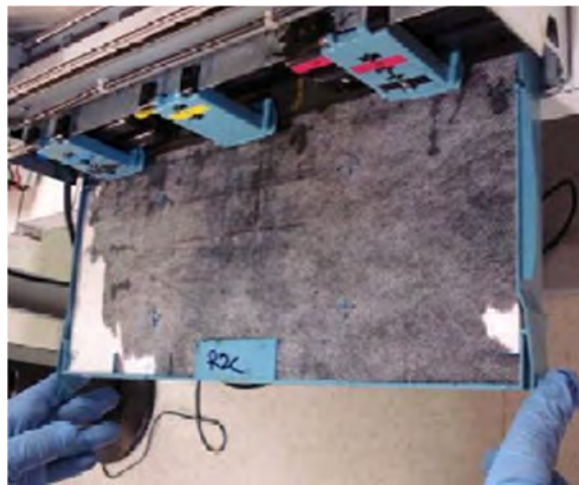
Waste Ink Absorber Replacement

The waste ink absorber was designed to last the life of the printer under normal printing conditions, taking into account evaporation. Replace the waste ink absorber when ink is leaking out of the waste ink tray.

1. Use fingers to squeeze the waste ink tray latches inwards, at the front of the unit, to release and slide the tray out.



Waste Ink Tray Latches



Waste Ink Absorber

2. Use a gloved hand to pull the waste ink absorber out of the waste ink tray and dispose of it according to local regulations.
3. Align a new waste ink absorber with the shape of the waste ink tray and push into place until evenly seated and flush with the tray top edge.
4. Slide the waste ink tray back into the frame until it clicks.

6.Troubleshooting

6.1. Maintenance Module (aka Service Station) Troubleshooting

The following table lists some possible problems related to the maintenance module, with possible causes and solutions.

Problem	Possible Causes	Solution
Motor stalls	• Jammed gear train from broken post or improperly seated gears • Squeegee (doctor blade) wedged, not seated properly • Debris build-up on blade and rollers, increasing friction • Bad motor	1. Check through each of the possible causes. 2. If possible, correct the situation. For example, re-seat the gears and squeegee, clean off debris from blade and rollers. 3. Re-test. 4. If motor is still stalled, contact Customer Service
Color Mixing	• Wiper roller (microfiber roller (MFR)) is saturated • Squeegee (doctor blade) wedged, not seated properly, or is bowed	1. If wiper roller is saturated, replace it. 2. If squeegee is not seated properly, reseat it. 3. If squeegee is bowed, contact Customer Service
Unable to remove maintenance module from the print engine	Latches on the maintenance module were not completely closed when the MM was inserted and they are now hooked on the bottom of the paper path	Contact Customer Service or your Application Engineer

6.2. Printhead Troubleshooting

Occasionally, print quality is affected by minor problems that arise with the printhead. The following table provides a list of common printhead issues, their symptoms, and solutions:

Problem	Problem Causes	Solution
Air and air bubbles causing blocked nozzles	Appear as missing groups of adjacent drops but the shape is often rounded or irregular	Cured by recirculation, priming or cycles of depriming and repriming. Often the bubbles will go away with time
Debris on printhead	Shows up as regularly missing or misdirected nozzles, or as ink color mixing	Cured by automatic servicing or manual wiping
Ink mixing	Appears as mixed or muddy colors. Can be caused by ink flooding, air in the printhead, or a dirty printhead	Cured by automated servicing or manual wiping
Electrical failure or poor electrical connection	Results in no print or crisp blocks of missing drops usually conforming to the printhead die boundaries	Cured by reseating the printhead or replacing the printhead

6.3. Print quality problems

Print quality problems are detailed in the Troubleshooting Guide.

Please contact Customer Support for further details.

6.4. Vortex 851R Troubleshooting Guide

GENERAL

Documents to read before (available on ftp)

Print engine:

- OEM Setup and Operations Guide
- OEM Troubleshooting Guide
- OEM Service and Repair Guide
- Technical Specifications

Vortex 851R:

- Training – software module
- Troubleshooting Flowchart
- SSC Release Notes

Checklist before doing any support

- Firmware is 20140509 version
- Driver is **R13**
- Print engine serial number
- USB AB cable is attached to print engine
- TTL cable is attached to print engine
- Preventive maintenance is done / sensors are clean
- KWS = default (3)
- NVM pages_per_cut = -1
- NVM Mpcarev 5
- NVM wiper motor E
- NVM pump motor B
- .NET 3.5, 4 is installed

Troubleshooting Tools

Serial communication between the NorthStar print engine and the host PC enables detection and analysis of issues. You will also need the related software for entering commands, serial logging. More information about it in the next phase.

Serial Communication and Related Tools

The most important troubleshooting tool is serial communication, which requires a special serial cable and some software on the PC. Recommend using PuTTY, a free, open source terminal emulator with strong logging capability. Once serial communication is set up, use serial logging for debugging issues.

Using TCL Commands and TCL Help

Many of the resolution actions listed in this document do not describe the exact TCL commands used. It is critical that any user of TCL be familiar with the self-documenting help feature.

Newer and better TCL commands are often being added and TCL commands can vary from one version of firmware to another.

Enter the appropriate TCL command to get the latest TCL commands and descriptions currently on the system.

For example:

- ❓ For a complete alphabetical list of TCL command with the description (that is, the “verbose” version), arranged in an 80 character column, enter [help](#)
- ❓ For a description of a specific TCL command, enter [help \[Exact\]2](#), where <srch> is the keyword.
- ❓ To read sensor values, use GPIO commands, for example: [TCL> help gpio 2](#)

Serial Logging

Serial logging records everything the printer does and keeps it archived. Recommend keeping **PuTTY** running at all times, with the logging feature enabled to create an unlimited length file, and using some scripts to occasionally copy the file contents to an archive location and trim the file back to zero size. It is good practice always to keep serial logs for long term reference.

Use TCL Help to learn about debug levels. Setting a higher debugging level will display more information. However, setting debugging too high can interfere with printer operations, since it takes time to write information to the log, so finding a debug level that’s appropriate is important.

Installing and checking the Custom Firmware routines

The custom Firmware routines used for extending the printers control interface with the buttons are stored in the Engine’s flash memory and are non-volatile, but firmware burning will clear the flash, so the custom extensions need to be reapplied after firmware upgrade!

Adding the custom routines is done by uploading the “*V851R_CustomFW.tcl*” file to the engine via USB, after there is working R13 Firmware on the engine. “*V851R_CustomFW.tcl*” can be sent to the engine with the help of the attached “*Add Custom FW Routines.bat*” batch file. Or manually from command prompt by typing “*usbcmd -i V851R_CustomFW.tcl*”. Of course the correct path need to be set for the usbcmd.exe as well as the .tcl file, and the engine need to be

under power, connected via USB and the firmware in standby mode! As long as the .tcl file the batch file and the USBcmd.exe are in the same folder there should be no issues with the upload!

After the custom routines are burned to the flash, the engine need to be restarted! The result can be checked via TTL cable during the power-up sequence the engine will print the following messages onto the TTL output:

1. Custom Initialization completed!
2. Starting ErrorCheckDaemon
3. Starting ButtonHandler Deamon
4. Initialization finished!

Their sequence is fixed, but there can be other messages between them, if the TTL connection is established too late to catch the initialization issuing a *"dbg_replay"* command will replay the recent outputs from the engine. Alternatively, sending a *"checkCustomDaemons"* command will print the current status of the resident processes to the TTL output. The result of this command should be *"ButtonHandler already running"* and *"ErrorCheckDaemon already running"*, this means that the two resident processes are currently running so the initialization of the printer was successful.

Dead engine,EWS,Firmware

Dead engine: When is a print engine dead?

After Dediprog re-flash, the putty output is empty or not interpretable, green LED is off.

EWS: How can I reach the print engine information page?

Open the toolbox.

Firmware: How can I burn the firmware?

All firmware has a Readme file. Usually that file has a detailed description about the firmware burning. The firmware burning is working step by step. mech_state of the engine should return STANDBY before running Step 2 and Step 4!

If the engine is not starting, or the Toolbox cant see

The best for the next parts to use TTL usb cable also!

Engine IP address dropout

How to detect:

net_myIP

Engine MAC address dropout

How to detect:

net_MAC_addr

does not return 0101010101

How to fix:

net_MAC_addr 0101010101

Firmware dropout

How to detect:

After starting the engine PuTTY returns:

```
ABCDGK012LMNPQRST
```

```
BootCode: Ver = 2010-2-23, v.1 program:28, platform:1 Processor speed 650, Memory Size 67108864, ASIC ID 0x1162620
```

How to fix:

Burn the firmware by running

Step 3; Step 4

OR

Re-flash with DediProg, than adjust NVM getset, IP and MAC address settings.

PRINT ENGINE: ERROR MESSAGES

Crit 63 03-phead offline cancelpage

1. Clean printhead contact sensors.
2. Replace print head
3. Flash Omnipec
4. Replace Omnipec

CARTRIDGE_MISSING_X

- clean cartridge chip with isopropyl alcohol
- clean chip readers with isopropyl alcohol
- run cm_ink
- replace ink cartridge

DATA_PATH_UNDERRUN

- clean the encoder wheel
- reduce image complexity
- reduce print speed to 6 IPS
- check for NVIMG corruption update EEPROM with Step 1
- use Adobe Reader 9 (good) instead of 10 (bad) for printing

Fatal 71 02 offline cancelpage

Dongle

Please ensure:

1. That P2002 on the MPCA has not been lifted from the solder pads on the PCA
2. That there is insulating tape on the dongle covering the solder pads
3. That the wires between the dongle PCA and P2002 are connected to the dongle PCA and to the connector

Incorrect NVM settings Interruption the sensor power

How to detect:

```
gpio_pin_get SNSR_PWR_B_EN  
returns 0
```

How to fix:

```
gpio_pin_set SNSR_PWR_B_EN 1 ss_home mech_clear_error
```

Lift sensor dirty

Clean lift sensor

Service station connection fault

Eject service station, unconnect, connect, home

Clean service station

Replace service station

Service station is in wrong position

How to fix:

```
maint_enable 0 ss_goto cap  
gpio_pin_get SS_LIFT_UP  
ss_down gpio_pin_get  
SS_LIFT_UP maint_enable 1
```

Explanation:

The state of the lift sensor can be checked by running the following TCL commands after the engine is fully booted:

- 1) `maint_enable 0` (disables maintenance to prevent the maintenance state machine from overriding commands to position the maintenance module)
- 2) `ss_goto cap` (moves to the capped position and raises the cap)
- 3) `gpio_pin_get SS_LIFT_UP` (should return a 1 indicating that cap is lifted and that the sensor is reading the correct position. Verify that the cap is lifted to the full height; if not then there is a problem with the lift mechanism. If the cap is lifted, then there is a problem with the sensor).
- 4) `ss_down` (lowers the cap)

- 5) gpio_pin_get SS_LIFT_UP (should return a 0 indicating that the cap is down). 6)
maint_enable 1 (re-enable the maintenance state machine).

Service station position unknown

How to detect:

ss_pos
returns unknown unknown

How to fix:

1. Clean service station
2. Replace lifter arm if broken
3. Clean sensor sled
4. Replace sensor sled

Old firmware

Upgrade firmware to at least 20140509, if possible, with DediProg.

Paper sensor connectivity

Follow CF07 of OEM Troubleshooting Guide

Valve is giving a clicking noise

Move the valve to all possible positions by ids_valve:

ids_valve openink ids_valve openair
ids_valve closed

Valve motor problem

Valve motor broken, or blocked by a particle. So engine can't recognize its position.
Disassemble and check, replace if needed.

Valve position unknown

How to detect:

gpio_pin_get IDS_VALVE_POS1
returns 1

AND

gpio_pin_get IDS_VALVE_POS2
returns 1

How to fix:

This can be due to misalignment of the disk on the valve shaft and may require replacement of the pinch valve (try manually cycling the valve using tcl commands to openink, openair, & closed and see if the appropriate position is returned). Before attempting to change out the valve, de-power the engine, then remove and reinsert all electrical connectors at the valve. If this fails to correct the problem, then the valve needs to be replaced.

Appendix A - Capturing the sensor/encoder data during lifter arm movement for reporting to Memjet

For servo move debounce to work the following settings and their values should be set (this is the default on power up):

```

TCL> servo_debounce SSLift
15
TCL> vars_getset servo_disable_gpio_debounce
0

    --- Instructions for collecting sensor history information ---
0.turn off maintenance:
    maint_enable 0

1. add lift sensor to servo history:
    servo_sensor SSLift 0 SS_LIFT_UP

2. store lift servo history:
    servo_history_store SSLift

3. go to known position and set start servo position to 0:
    ss_down; servo_pos SSLift 0

4. reset servo history:
    servo_history_reset

5. run lifter servo for ~2 rotations:
    servo_move SSLift 50000 150000

6. on PC run this command to download servo history:
    usbcmd.exe -c servo_history > sslift.txt

7. go back to known position and turn maintenance back on:
    ss_down; maint_enable 1

```

MAINTENANCE_BUSY

Entry/exit sensors indicate paper inside the engine

How to detect:

```

gpio_pin_get PZONE_ENTRY_SNSR
returns 1

```

AND

```

gpio_pin_get PZONE_EXIT_SNSR
returns 1

```

How to fix:

- Check for paper pieces left inside the engine
- Clean both sensors

NVM dropout

How to detect:

```

nvm_getset mpcarev
returns 3
nvm_getset wiper_motor
returns none

```

nvm_getset pump_motor
returns 0

How to fix:

nvm_getset mpcarev 5 nvm_getset
wiper_motor E nvm_getset pump_motor
B shutdown 1

PAPERPATH_CUTTER_ERROR

reset

PAPERPATH_FEED_TIMEOUT

- clean sensors
- check paperpath
- check paper settings & positioning

PAPERPATH_PAPERJAM

- clean entry/exit sensors

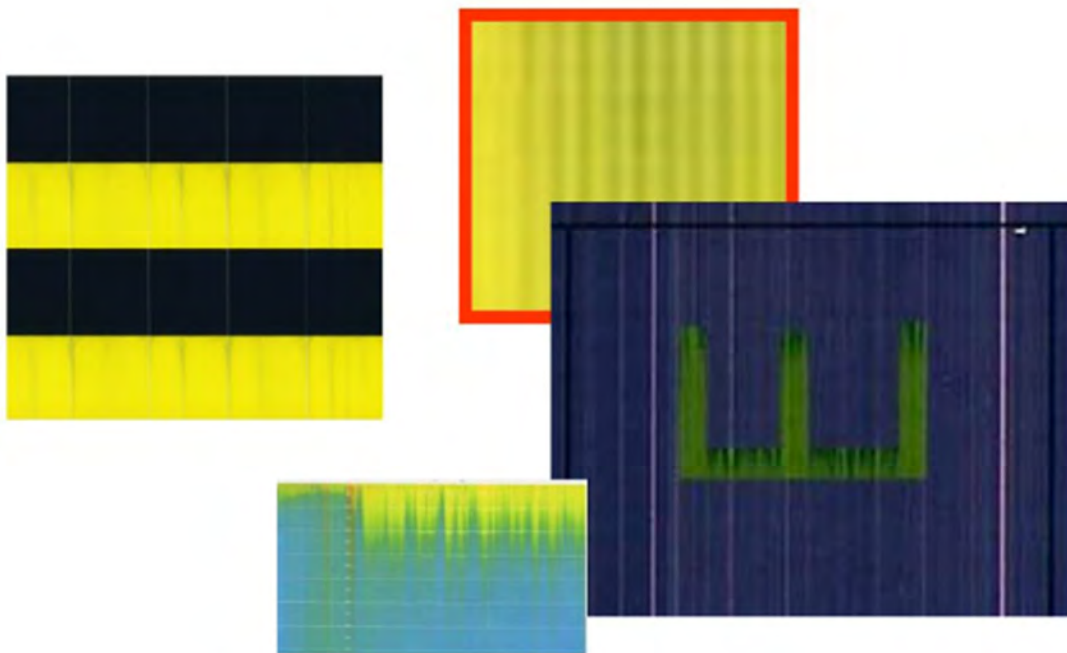
6.5. Print Quality Issues

Print quality issues can be grouped into the following categories, as explained in subsequent sections. Two-letter abbreviations are used as the prefix for each category, so that they can be reported to the support team and tracked with metrics for further analysis.

- Color Mixing (CM)
- Streak (SR)
- Dot Misplacement (DP)
- Banding (BD)
- Other print quality General Defects (GE)

Color Mixing (CM)

Color mixing (unwanted intrusion of one or more colors in another color's area) shows in a range of defects, as illustrated here and detailed in issues with the CM prefix.

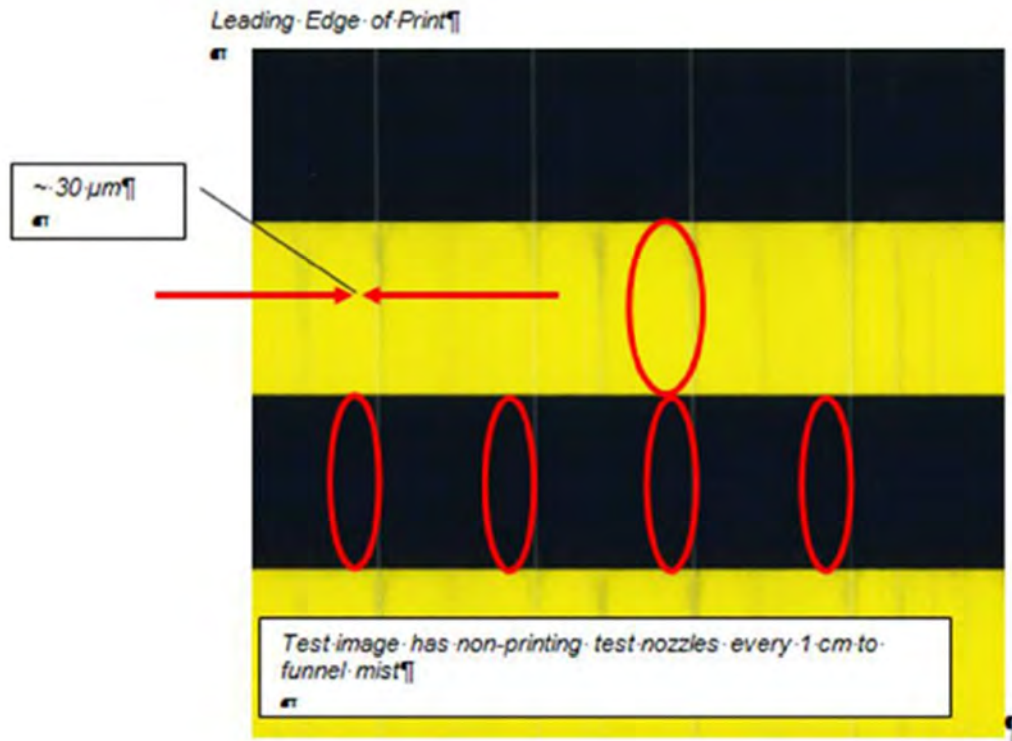


Picture of Color Mixing Samples

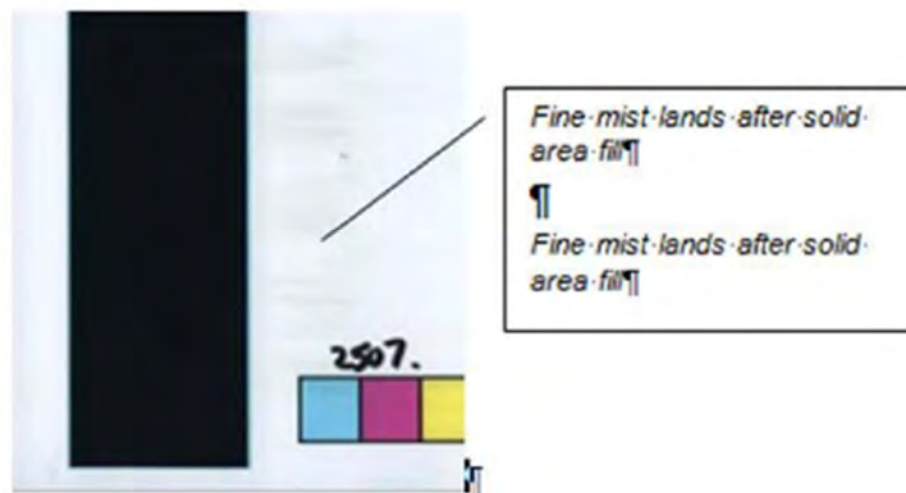
Examples for Color Mixing

CM01: Fine Clouds of Ink or Misting

Issue CM01: Fine Clouds of Ink or Misting displays as a fine spray of small ink drops from the upstream print area that is falling on the downstream print area of the page.



Picture of Color Mixing: Clouds of Ink



Picture of Color Mixing: Fine Misting

Cause

Misting typically results from by the poor “break off” of the tails of the ejected ink drops, which results in very small droplets that have very little momentum. Higher pen-to-paper spacing, difficult images, or old printheads may amplify this defect. To resolve this issue:

1. Verify that the defect is beyond the threshold.
2. Verify that the correct profiles are being used for the media. If so, continue to the next step. If not, use the correct profile(s) and re-evaluate the performance
If not resolved, continue to the next step.
3. Verify that the printhead-to-paper spacing (PPS) is within limits.
4. If within limits, continue to the next step. If beyond the threshold, adjust the spacing. If not resolved, contact Customer Service and report error code CM01-03—Color misting unresolved.

Cause

CM02: Color Contamination Repeated at Beginning of Every Page

CM02 displays as small amounts of color contamination that appear on top of a page. The contamination is reduced after a couple of pages.



Picture of color Mixing: Color Contamination

The printhead is covered with ink somewhere and the ink keeps wicking back to the channels. This happens most often on printheads with paper guides since ink wicks beneath the paper guide and forms a reservoir of ink that damages future prints.

Resolution

1. Verify that the defect is beyond the threshold. If beyond the threshold, continue to the next step.
2. Check if the correct maintenance process is applied (KWS + IPS). Use the correct maintenance profile and re-evaluate the performance.
If not resolved, continue to the next step.
3. Run the color mixing recovery process (maint_clear_color_mix 1) and re-evaluate the plots.
If not resolved, continue to the next step.
4. Power off the printer, remove the printhead, and thoroughly clean it manually.
5. If there is a paper guide, remove it and clean underneath it.
If not resolved, contact Customer Service and report error code CM02 -03: Servicing process not effective.

Cause

CM03: Color Contamination at 1 mm Intervals

CM03 usually displays as color contamination lines that continue at approximately 1 mm intervals after the majority of the color has cleared.



Picture of Color Mixing: Color Contamination at 1mm intervals

Ink mixing is caused by location of feed holes in the back channel.

Resolution

Check the tubes at the back of the print engine before circulating ink. If it is clear in some places,

1. Run the servicing process and re-evaluate the plots. *TCL › maint_clear_color_mix <level>*
If not resolved, continue to the next step.
2. Run the servicing process three times and re-evaluate the plots.
If not resolved, continue to the next step.
3. Take the PH out, install the designated golden unit, and print the same set of plots.
report error code CM03-04: PH failure analysis required.

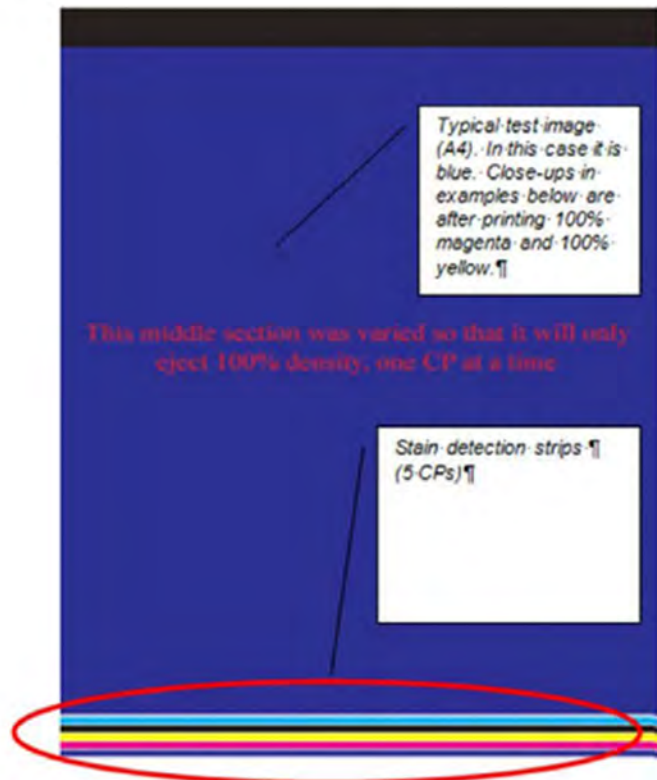


☑ If not resolved, further printhead failure analysis is required. Contact Customer Service and

Cause

CM04: Color Mixing in the Middle of the Page

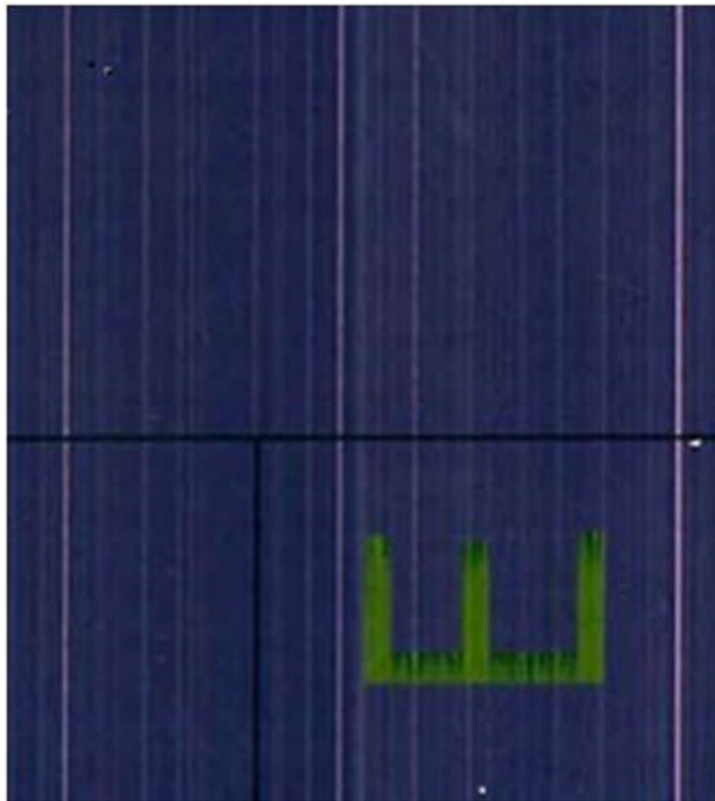
CM04 is the printing of mixed colors after long, continuous printing or short periods of idle time (~ 5 seconds) from a printhead that does not show signs of internal leaks.



Picture of Color Mixing: Example 1



Picture of Color Mixing: Example 2



Picture of Color Mixing: Example 3

Cause

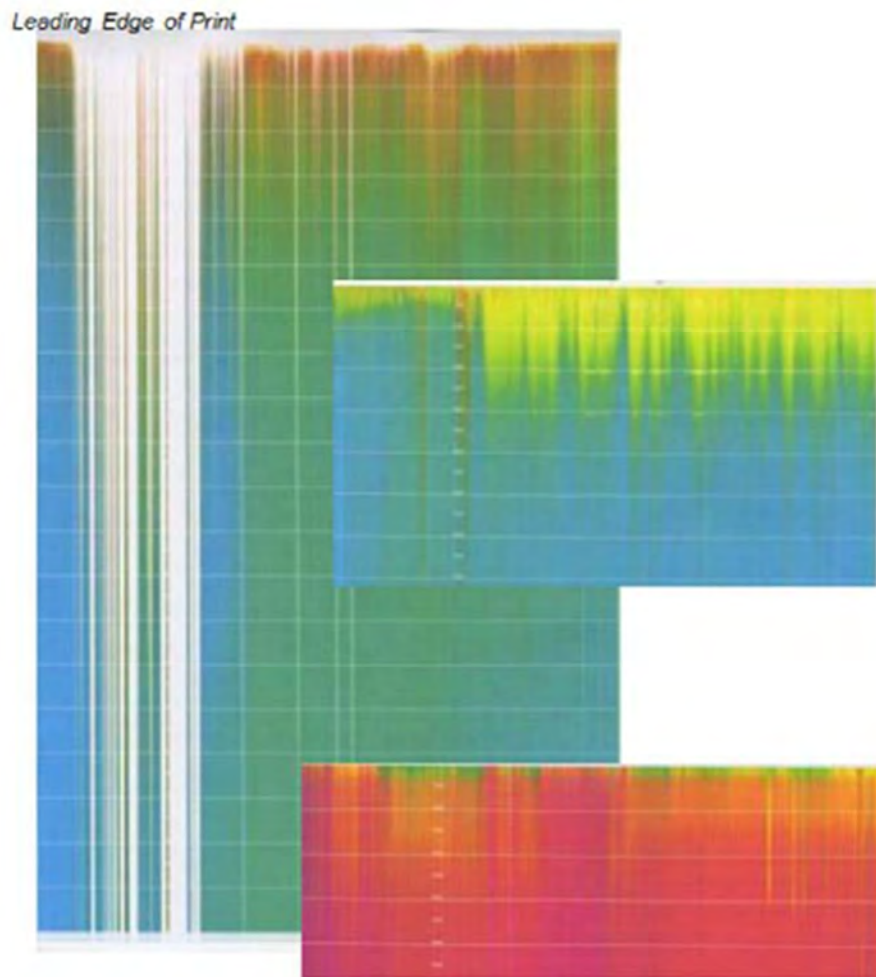
Color mixing results when ink migrates across the printhead surface from heavily printing nozzles into the nearest odd or even nozzle row that is not printing.

Resolution

1. Use profile tool loading (Printing Preferences→Color Tab→Color Matching) to verify that the correct color profiles are being used. This is a possible operator handling issue. Use the correct profile and re-evaluate the performance.
 If not resolved, continue to the next step.
2.  Run the servicing process (*TCL › maint_clear_color_mix <level>*) and re-evaluate the plots. If not resolved, contact Customer Service and report error code CM04-03 Servicing process unresolved.

CM05: Color Contamination

CM05 Color Contamination is when prints that are supposed to be one color are coming out in a different color.



Picture of Color Contamination Samples

Cause

Although leaks are possible in the backchannel, the most common cause of color contamination is mixing of ink from drool on the nozzle plate. Also, if the printhead backpressure is not preserved correctly, this type of color mixing may happen more frequently.

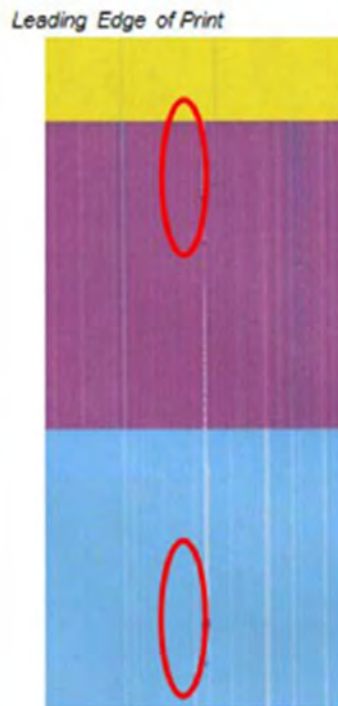
Resolution

1. Run the maintenance algorithm and re-evaluate the plots. *TCL › maint_clear_color_mix <level>*
If not resolved, continue to the next step.
2. Evaluate the ink cartridge to ensure there are no leaks out of the ink cartridge snorkel. If there are leaks, run the purge algorithm.
If not resolved, continue to the next step.
3. Remove the printhead and install the designated golden unit.

4. Purge the ink and clean the nozzle plate before resuming backpressure. Then, print the same set of plots.
 - ❓ If not resolved, contact Customer Service and report error code CM05-04: Possible printhead damage.

CM06: Vertical Lines Throughout Page/Drooling

CM06 displays as vertical white lines followed by a dark dot.



Picture of Vertical Lines with Dark Dot from Drooling

Cause

A puddle has formed in front of the nozzle, possibly due to a particle or fiber on the printhead surface, and is capturing the drops that are fired. Eventually, the accumulated puddle drops onto the page.

Resolution

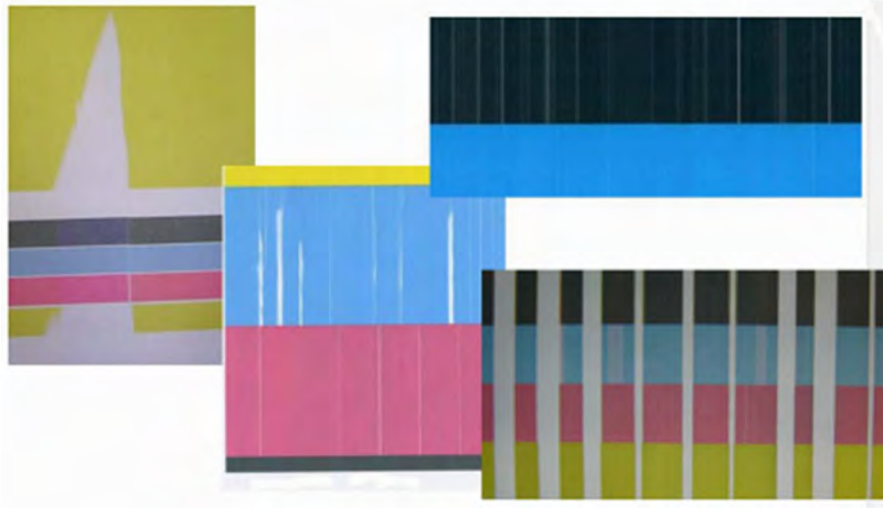
1. Run printhead servicing (i.e., a wipe): *TCL › wipe_basic* If not resolved, continue to the next step.
2. Run the maintenance algorithm 1, 2: *TCL › maint_user_recovery 1*
TCL › maint_user_recovery 2 If not resolved, continue to the next step.
3. Remove the printhead and manually wipe the printhead. Re-insert the printhead to see if this has corrected the problem.
If not resolved, continue to the next step.
4. Replace the printhead



If not resolved, contact Customer Service and report error code CM06

Streaking (SR)

White or grey lines or parabolas running vertically in print jobs, as well as white, unprinted areas, are called “streaks.”



Picture of Streaks

SR01: Growing Nozzles Out

SR1 displays as a region of “nozzles out” (that is, nozzles stop working) that becomes increasingly worse on the way down the page or when any large (>1cm wide) region of nozzles out moves or changes down the page.

Cause

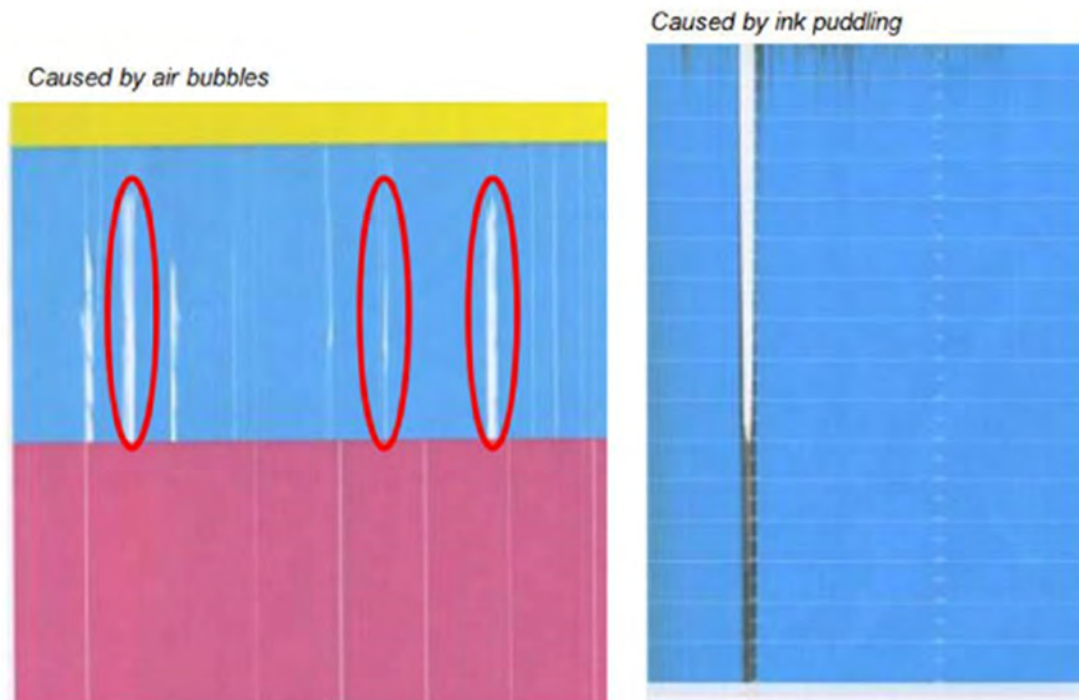
This print defect indicates a large bubble, or the beginning of a deprime, where air is entering through some of the nozzles or the Ink Delivery System (IDS), and expanding to other nozzles.

Resolution

1. Run a General Maintenance Process.
TCL › maint_user_recovery 1
TCL › maint_user_recovery 2
TCL › maint_user_recovery 3
If not resolved, continue to the next step.
2. Perform a pressure prime (recovery 2). TCL › ids_light_pressure_prime If not resolved, continue to the next step.
3. Inspect system for leakage (e.g. kinked tubes, bad fluidic interconnect connections, etc.)
If not resolved, contact Customer Service and report error code SR01-04: Unresolved streaks.

SR02: Large Missing Nozzles with Varying Amount

SR02 displays as a parabola-shaped area in the middle of the page.



Picture of Streaks: Parabolas

Cause

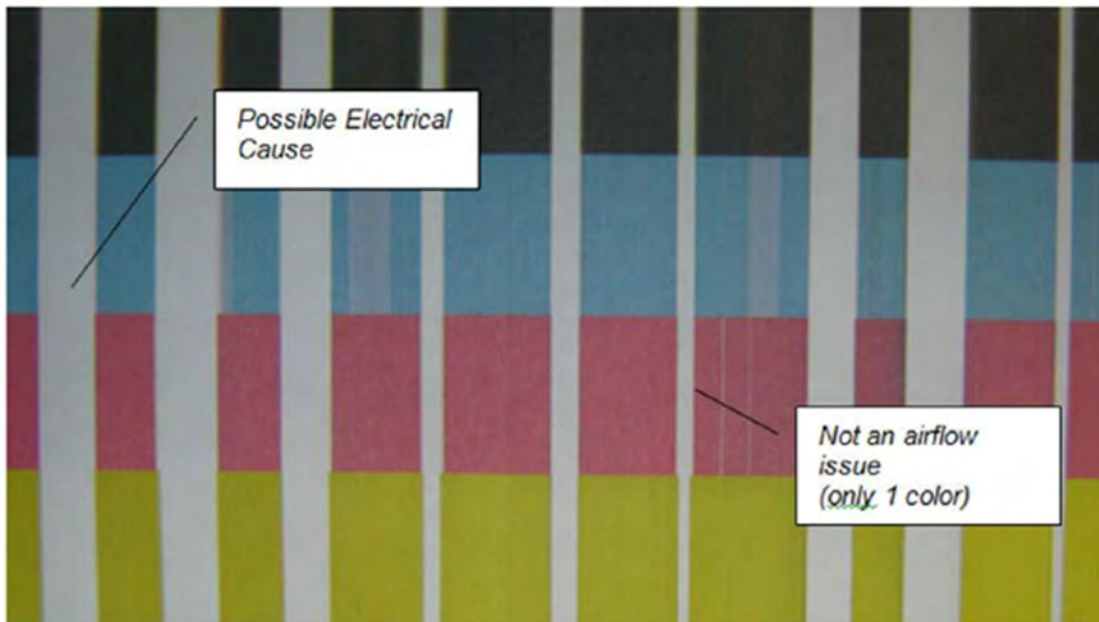
Bubbles can air-block ink from getting to nozzles or a puddle has formed in front of the nozzle.

Resolution

1. If the white gap is persistent from plot-to-plot, it is likely to be from an air bubble.
Run Servicing (Line Prime + Pulse Prime) and look for improvement. If not resolved, continue to the next step.
2. If the white area is shaped like a parabola and the color of printing at the bottom of the page is different, it is likely to be from an ink puddle. Run Servicing, Level 1 to clean the printhead.
If not resolved, contact Customer Service and report error code SR02-03: Unresolved parabola.

SR03: Large White Area

SR03 displays as a large white area with almost no nozzle firing and is consistent from page to page.



Picture of Streaks: White Areas



Picture of Streaks: Single Die Cut

Cause

This print defect indicates an electrical issue or damage to the printhead.

Resolution

1. For lines approximately 1" wide, print a spit plot. If the missing area exactly follows the die boundaries, then it is probably caused by an electrical problem. Remove the printhead and clean up the contacts. Check for the board and make sure there is no damage on the printhead.

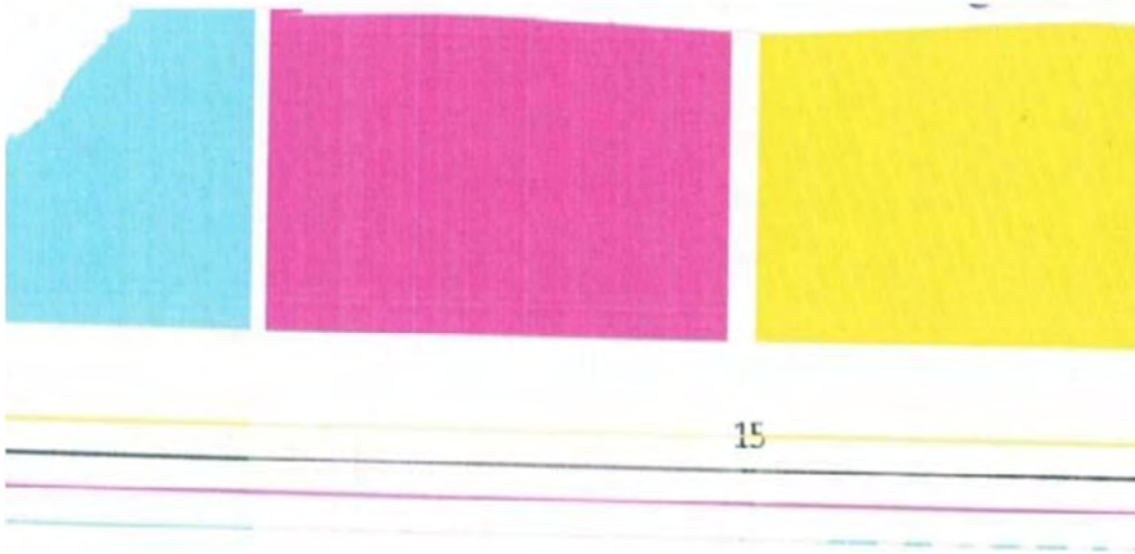
🔍 If not resolved, continue to the next step.

2. If all the colors are out, there may be a hydration problem. Run the dehydration recovery algorithm. *TCL > dy_rec*

🔍 If not resolved, contact Customer Service and report error code SR03 -03: Unresolved white area.

SR04: Lines/Prints Fall

In SR04, text or images become weaker page after page and finally drop out.



Cyan Nozzles are Out

Picture of Streaks: Lines or Prints Fail

Cause

The nozzles can dry out over time if there is not enough on-page and inter-page servicing. Harsh environmental conditions (e.g., too dry or hot), fast printing speed, or some media types can accelerate dehydration.

Resolution

1. Evaluate maintenance algorithm (inter- and intra-page servicing (that is, mid-page servicing). **TCL › nvm_getset**
If not resolved, continue to the next step.
2. Run maintenance algorithm (wipe).
If not resolved, continue to the next step.
3. Consider the environmental conditions. Report defect SR04-03 Unresolved lines/print fall.

SR05: Random Small Streak

SR05 displays as random, small, thin lines that are visible on the print but do not grow along the page.



Picture of Random Small Streaks

Cause

Thin streaks can be caused by internal contaminants, external contaminants (fibers), air bubbles, or printhead damage.

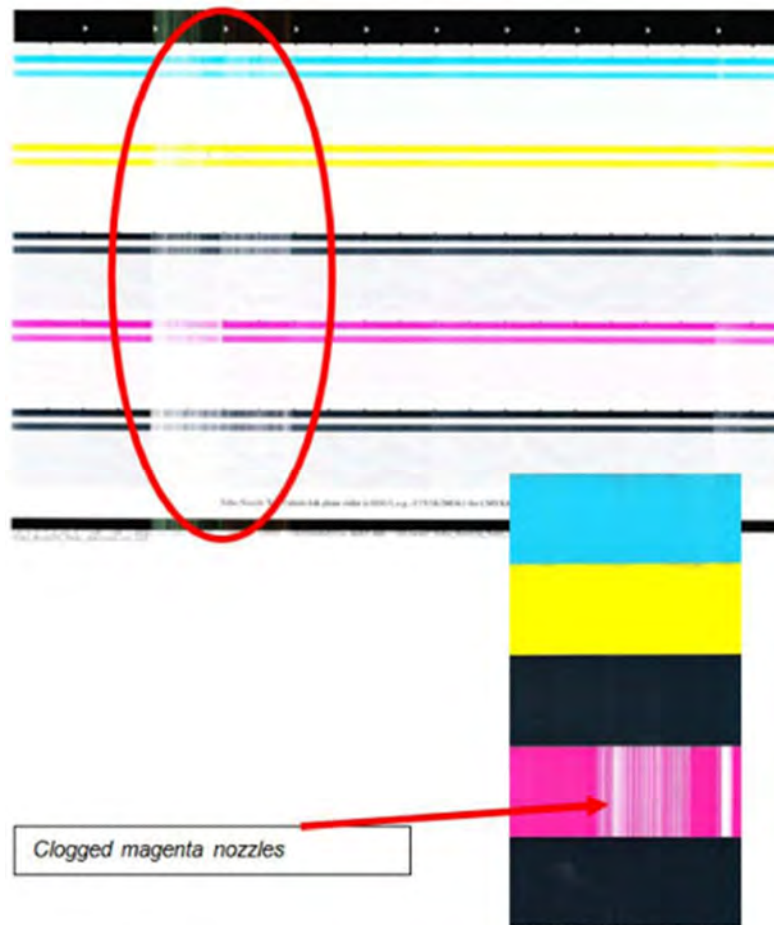
Resolution

1. If the white gap is persistent from plot to plot, print a 5-band plot or a plot that has primary colors. If gap is only in one of the primary colors, the streak is likely to be from an air bubble.
Run the maintenance algorithm (pressure prime).
 If not resolved, continue to the next step.
2. When neighboring color channels have streaks at the same location, there is an external contamination. Run the maintenance algorithm (wipe). If not resolved, continue to the next step.

3. If the streak is shaped like a parabola and the color of the printing at the bottom of the page is different, it is likely due to an ink puddle. Run maintenance algorithm 1.
 If not resolved, contact Customer Service and report error code SR05:-04 Unresolved thin streaks.

SR06: Weak Chips

SR06 displays as weak chips that result when some dies do not eject properly. The issue does not improve by varying pulse width.



Picture of Streaks: Weak Chips Example

Cause

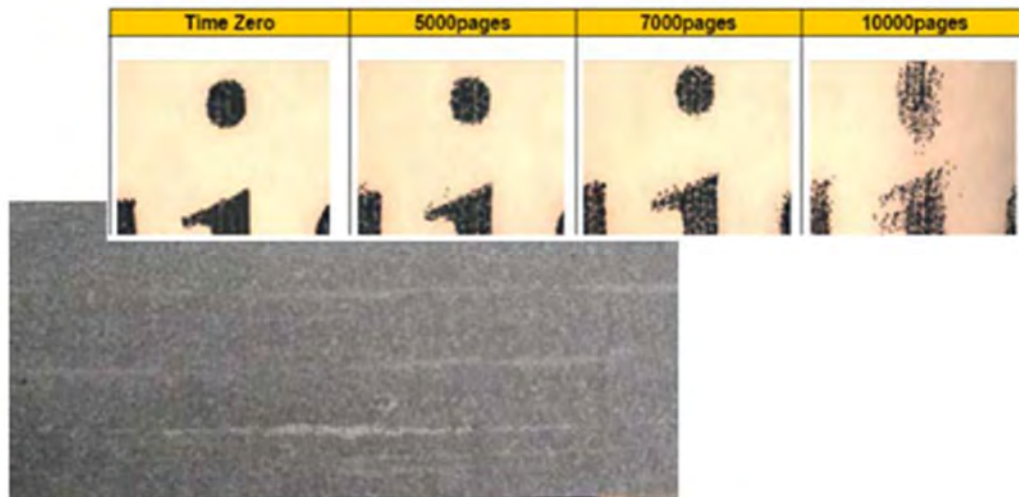
This print defect may result from an electrical failure due to a cracked die or extended periods of nozzle dehydration.

Resolution

1. Run maintenance algorithm three times. **TCL > dy_rec**
followed by: **TCL > maint_clear_color_mix**
☒ If not resolved, continue to the next step.
2. If not recoverable after running the service algorithm, the streaks are likely to be due to weak chips. Replace the printhead and send the old one to the engineering team for further investigation. Report this as error code SR06-02: Weak chips.

Dot Misplacement (DP)

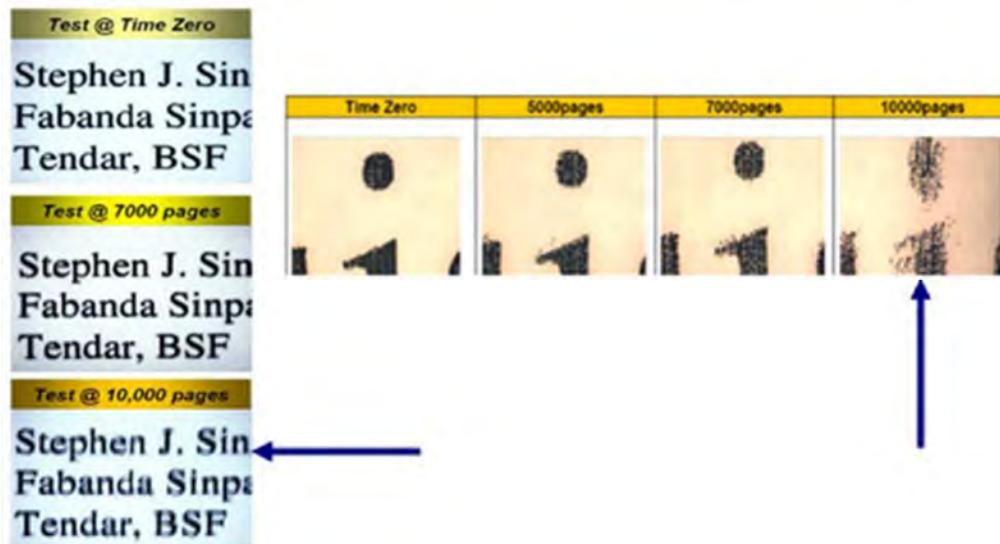
Dot misplacement can be observed as lines or solid fill areas that are fuzzy.



Picture of Dot Misplacement Examples

DP01: Poor Text Quality

In DP01, text becomes fuzzy or unfocused after many thousands of pages have printed.



Picture of Dot Misplacement: Text Becomes Fuzzy Over Time

Cause

Asymmetric “wear” of the MEMS heaters over time, after a few tens of millions of ejections, results in the odd and even nozzle rows having different directionality in the Y-axis.

Resolution

1. Run the maintenance algorithm. *TCL › maint_user_recovery 1*
If not resolved, continue to the next step.
2. Check the printhead-to-paper spacing (PPS) with the PPS tool.
If not resolved, continue to the next step.

3. Replace printhead with a new one or swap with another printhead.

If not resolved, contact Customer Service and report error code DP01-04.: Poor text quality unresolved.

DP02: Graininess

Graininess presents as a mottled, random pattern in a solid fill area.

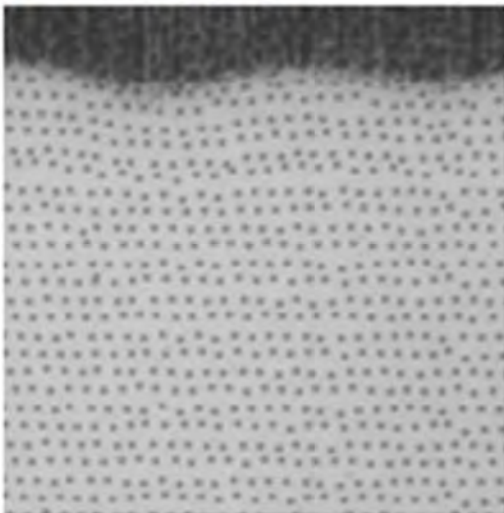


Picture of Dot Misplacement: Graininess

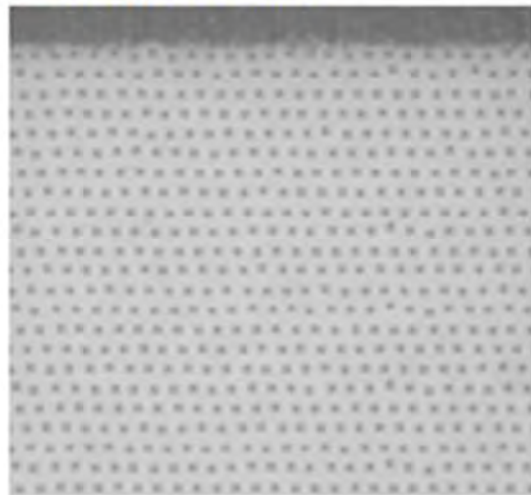
Cause

Excessive printhead-to-paper spacing or a worn-out printhead can cause this printing defect.

Poor Dots Placement



Good Dots Placement



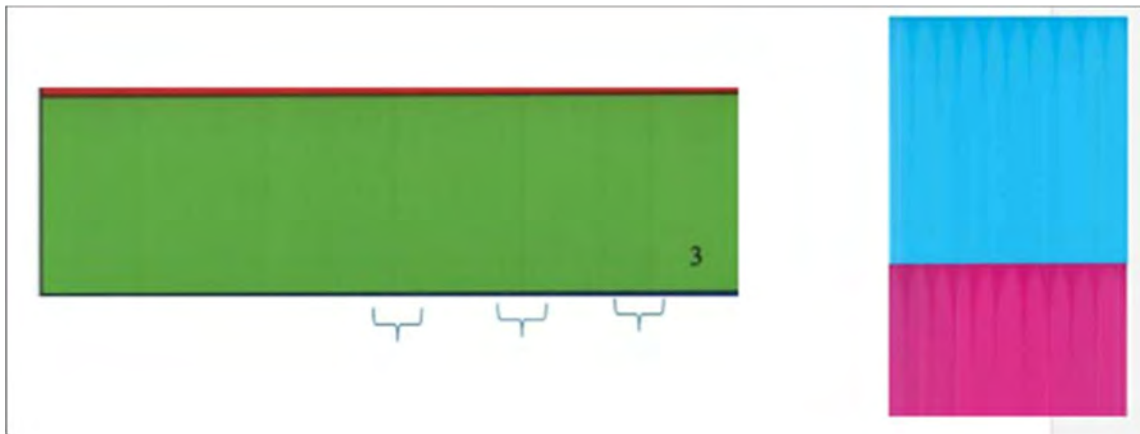
Picture of Dot Placement Examples Poor and Good

Resolution

1. Print a diagnostic plot to evaluate individual dot placement. If the individual dot pattern is irregular, evaluate PPS.
 - ❓ If not resolved, continue to the next step.
2. Replace the printhead.
 - ❓ If not resolved, contact Customer Service and report error code DP02-03: Unresolved graininess.

Banding (BD)

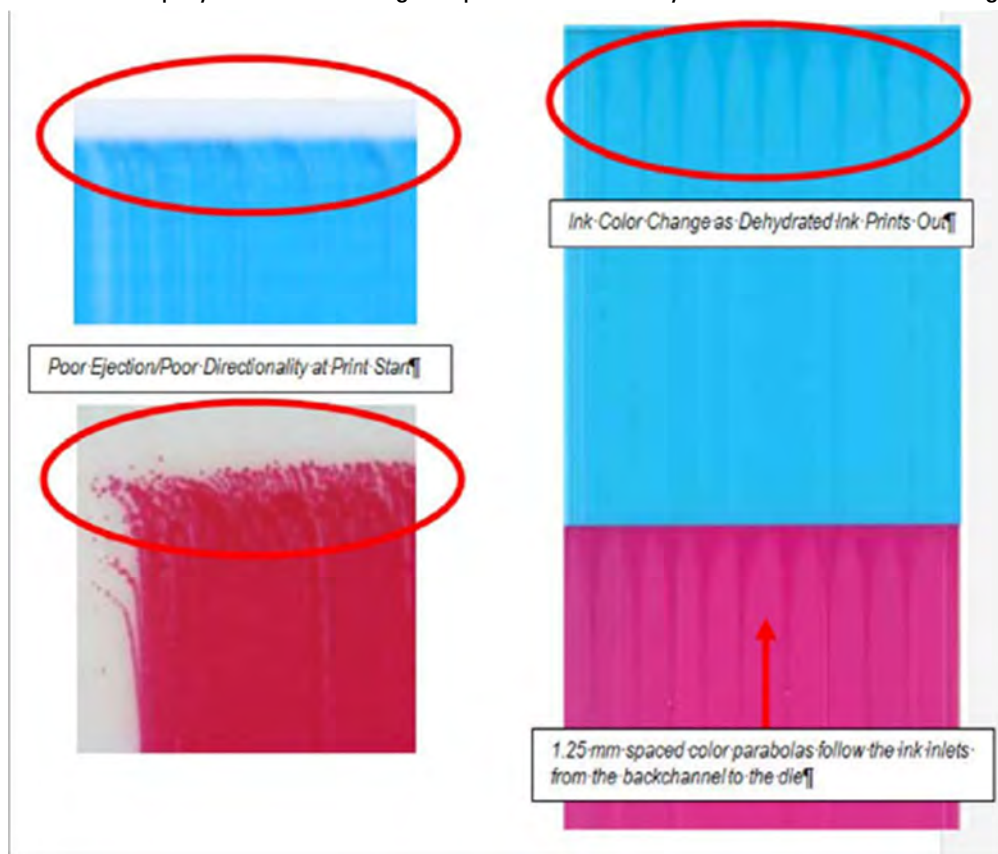
Banding defects are shown in the following illustration and detailed in subsequent sections.



Picture of Banding Examples

BD01: Initial Page Startup Defect

BD01 displays as color change or poor directionality at the start of nozzle firing.



Picture of Initial Page Startup Defect

This defect results from dehydration of the ink nozzles.

Resolution

1. Check the Maintenance Algorithm (KWS + Inter page spit)

TCL > maint_user_recovery 1

❓ If not resolved, continue to the next step.

2. Re-run servicing and print the plots again.

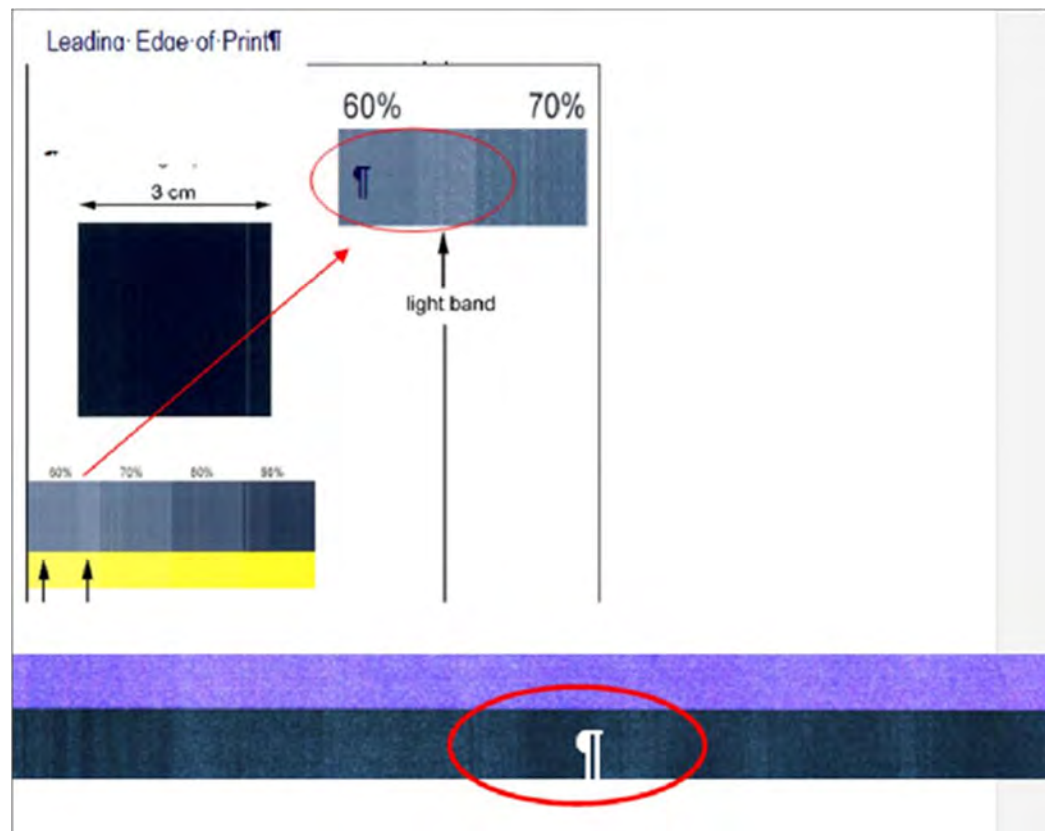
❓ If not resolved, continue to the next step.

3. Replace the printhead.

❓ If not resolved, contact Customer Service and report error code BD01-04: Initial page startup unresolved.

BD02: Optical Density or Color Variation

BD02 displays as an area of half-tone prints with unexpected color variation or horizontal, thin lines with dot placement error.



Picture of Banding: Variation of Optical Density or Color

This defect results from heat (generated while printing the solid black area) that creates a sub optimal ejection behavior of the nozzles that later have to print the half-tone area.

Resolution

1. Compare the defect against the acceptability threshold (PQ1700). If worse than the threshold, run the maintenance algorithm.

 If not resolved, continue to the next step.

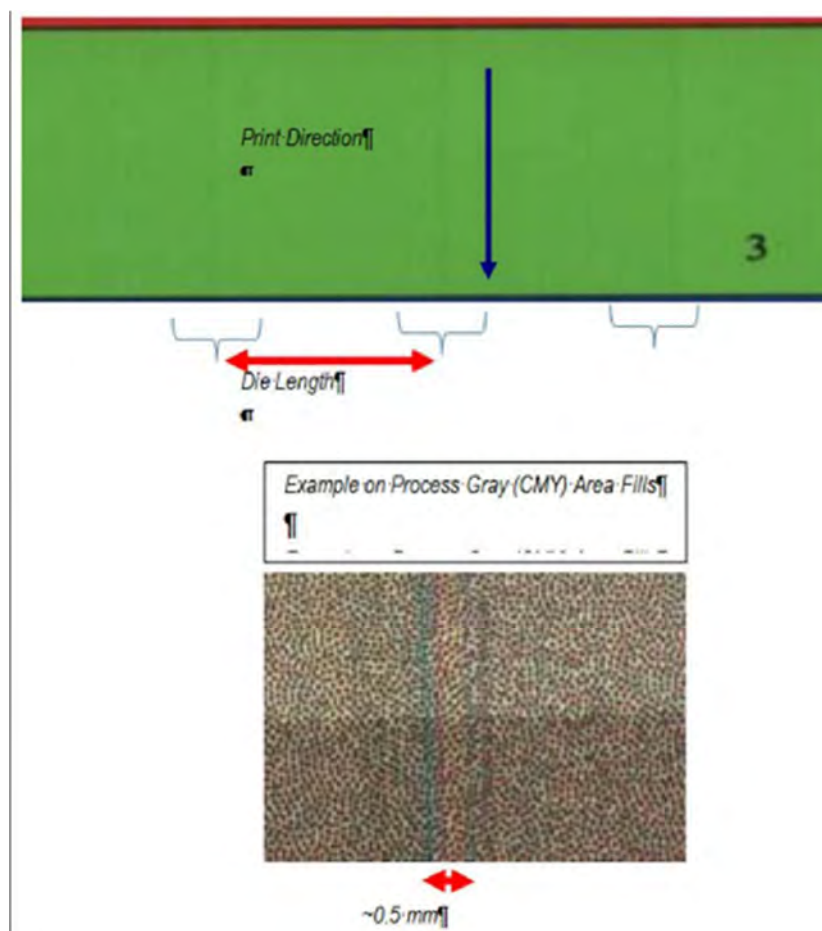
2. Replace the printhead.

 If not resolved, contact Customer Service and report error code BD02

-03: Banding with variation unresolved.

BD03: Die Boundary Banding

BD03 displays as dark, light, or rainbow bands 0.5 mm to 1 mm wide at die boundaries not caused by dead nozzles or mist.



Picture of Die Boundary Banding

This defect results from a shift in dot grid from one die to the neighboring die due to a printhead related defect, lack of die flatness at die ends, or a combination of both.

Resolution

Compare the boundary against the threshold.

❏ If worse, continue to the next step.

Run the maintenance algorithm. **TCL › maint_user_recovery 1** continue to the next step.

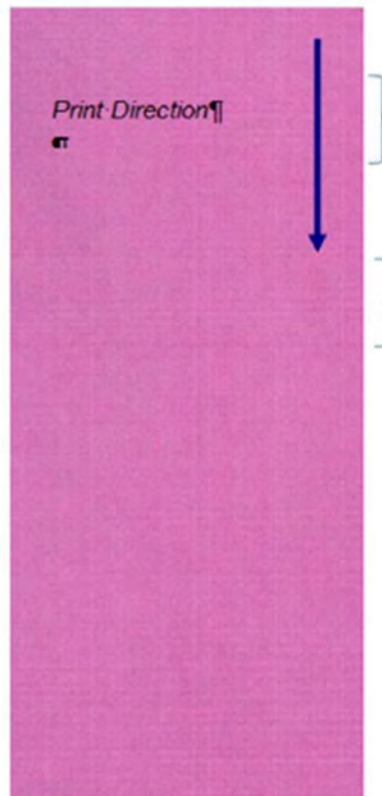
❏ If not resolved,

1. Print the spider pattern and inspect to see if anything stands out.
2. Replace the printhead.

❏ If not resolved, contact Customer Service and report error code BD03 -04: Die boundary banding unresolved.

BD04: High Frequency Banding

BD04 displays as horizontal, high frequency, dark bands that are visible in solid fill area.



Picture of High Frequency Banding

This defect is caused by a variation in dot placement due to paper path, firmware/rendering, or a combination of both.

Resolution

1. Evaluate the paper path and note any thing causing disturbance to the media.
 - If not resolved, continue to the next step.
2. If a new color profile is used, consider going back to the old ones and re-evaluate the banding
 - If not resolved, contact Customer Service and report error code BD04-03: High Frequency banding unresolved

BD05: Low Frequency/Page Advance Banding

BD05 displays as a horizontal, dark bands, visible in solid fill areas mainly close to the top or bottom of the page.



Picture of Low Frequency/Page Advance Banding

Cause

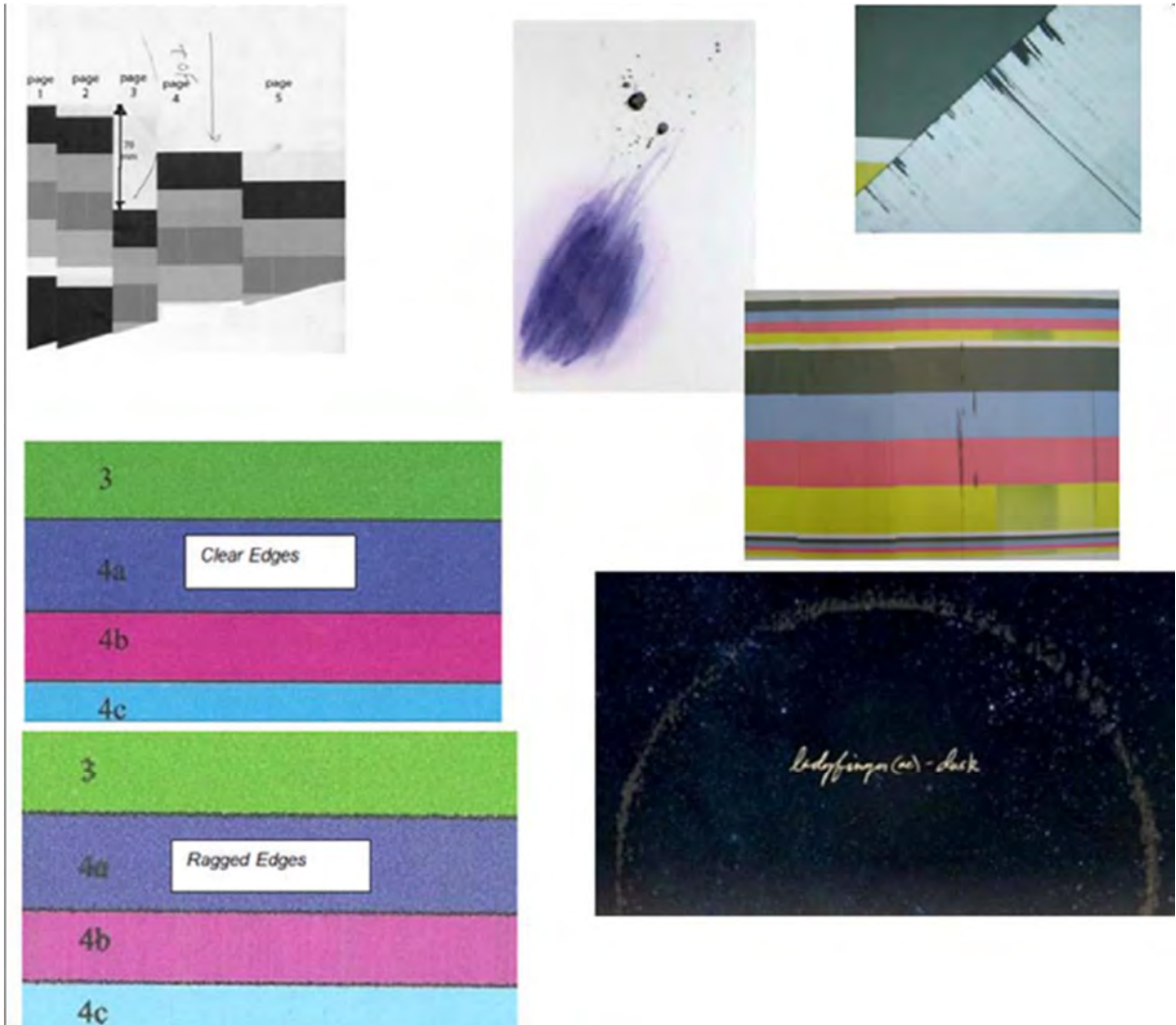
This defect is caused by a variation in dot placement due to the paper path in the print engine, the systems that feed in the paper, or a combination of both.

Resolution

1. Compare banding to the acceptability threshold. Evaluate the paper path and note anything that is disturbing the media.
 - if not resolved, continue to next step.
2. Evaluate cleanliness of the encoder and paper path sensors
 - If not resolved, contact Customer Service and report the error code BD05-03: Low frequency/page advance banding.

Other General Print Quality Errors (GE)

This section covers issues that come from mechanical behaviors, such as varying distance for top of form, smears or dots, marks or ink on the paper, scrambled or skewed printing.



Picture of Other General Print Quality Errors

GE01: Marks on the Print Paper, Dust

GE01 presents as fine, detail artifacts on the print that resolve after running maintenance.



Picture of Dust and Marks on Paper

Cause

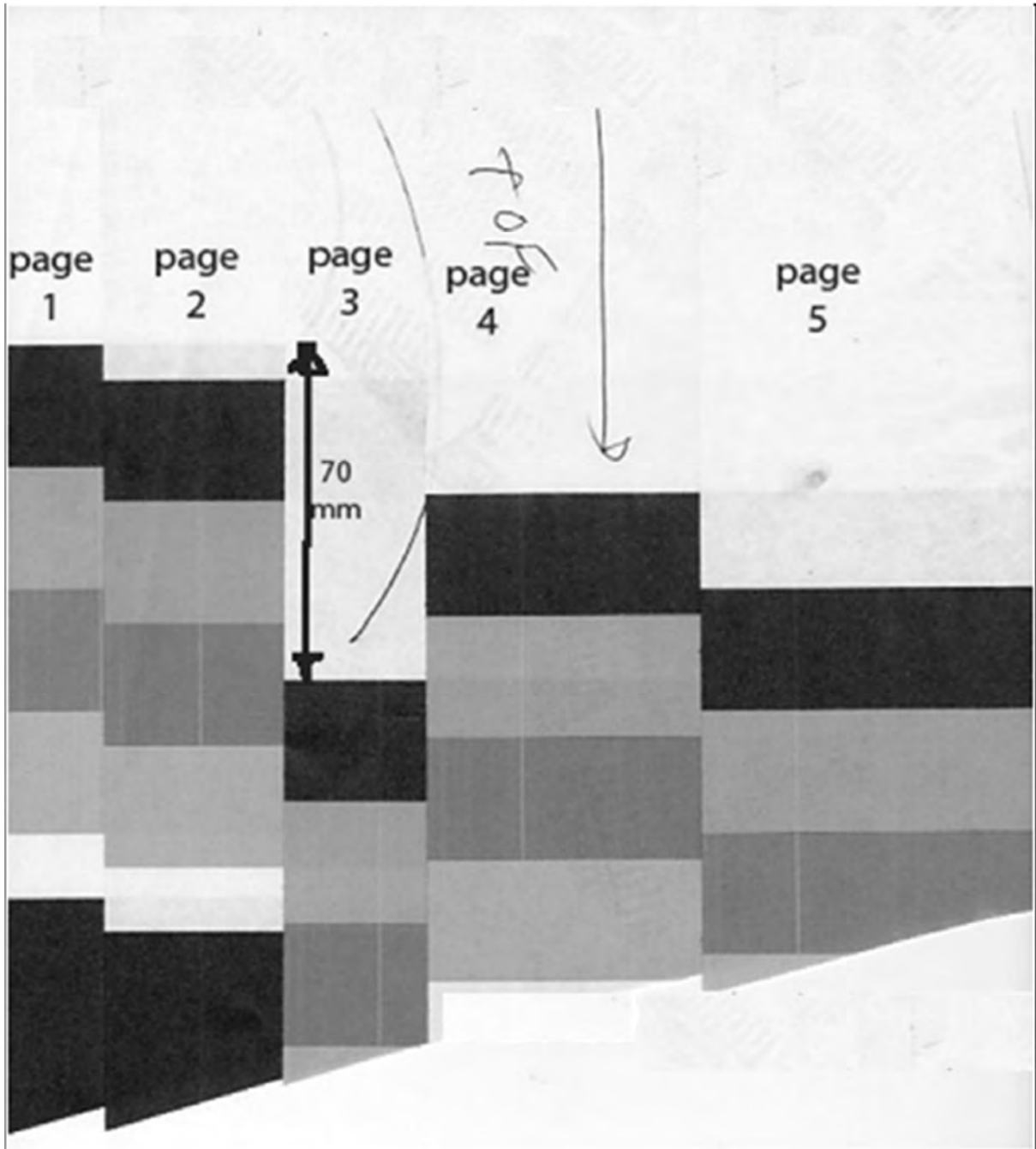
This defect results from paper dust or other particles hanging from the printhead.

Resolution

1. Run the maintenance algorithm to clean the printhead. *TCL › maint_user_recovery 1*
 - If not resolved, try the next level servicing
TCL › maint_user_recovery 2
TCL › maint_user_recovery 3
 - If not resolved, manually wipe the printhead ▣
If not resolved, continue to the next step.
2. Check if the media has substantially more than average dust. Replace media.
 - ▣ If not resolved, contact Customer Service and report error code GE01-03: Dust and marks unresolved.

GE02: Varying Top of Form Margin

GE02 presents as a varying margin from lead edge of paper to top of print form.
Measurement
varies significantly.



Picture of Varying Top of Form

The print defect may result from dirty sensors or data that has timed out.

Resolution

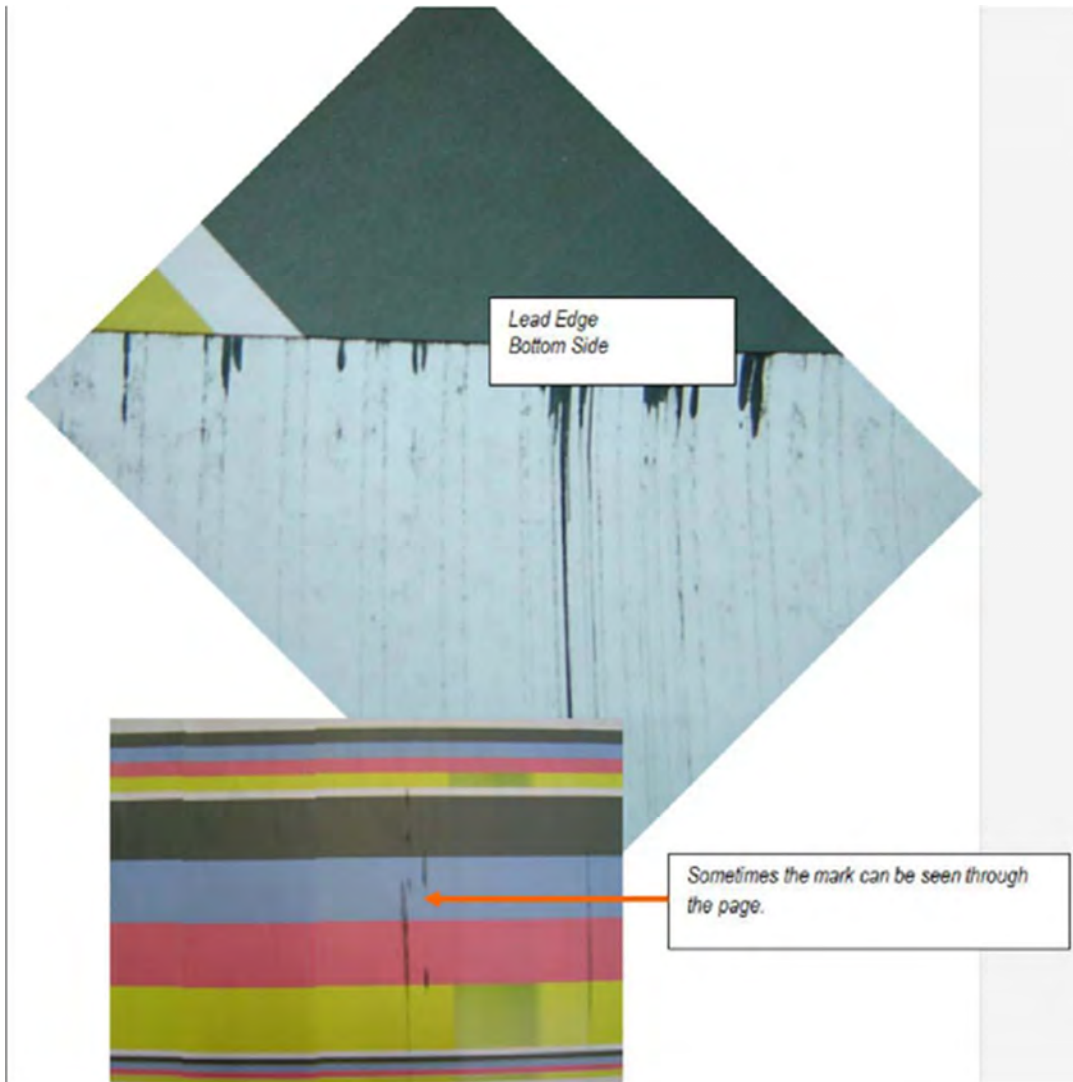
1. Evaluate paper path sensors.

☐ If not resolved, contact Customer Service and report error code GE02

02: Varying top of form margin unresolved.

GE03: Ink on Back/Top of Page

GE03 displays as ink tracks on back or front side of the media.



Picture of Ink on Back or Top of Page

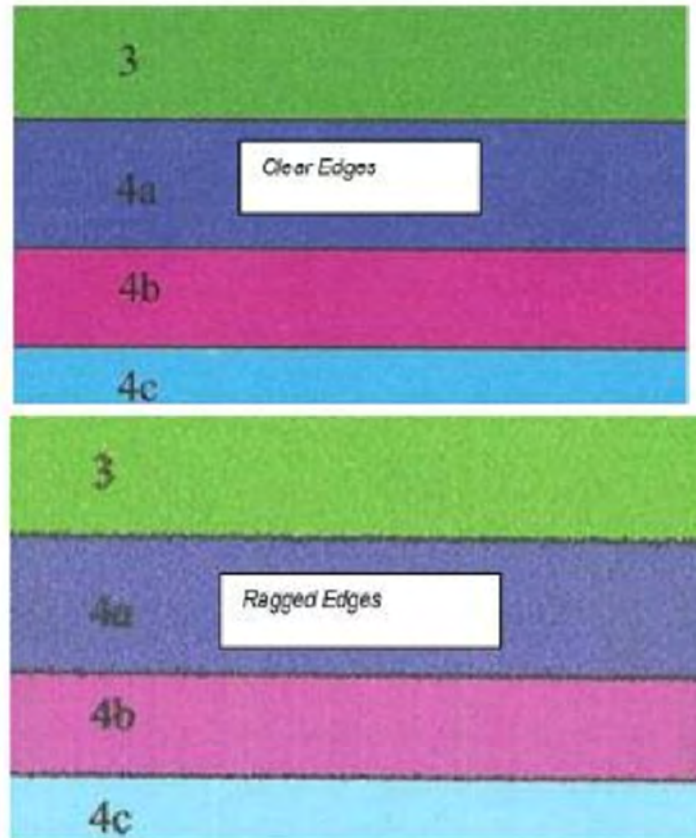
This defect indicates that the platen is dirty or an ink puddle is building up on the print engine.

Resolution

1. Physically wipe the platen.
If not resolved, continue to the next step.
 2. Evaluate the ink buildup inside the print engine
- If not resolved, contact Customer Service and report error code GE03-03: Ink on back/top of page unresolved.

GE04: Bleed

Line or text quality looks very fuzzy. Edges of each line look ragged. Some media may have better performance than others. print mode and color profiles are the main ways used to control this behaviour.



Picture of Examples of Clear Edges and Ragged Edges (Bleed)

Bleed results from ink and media interaction. Ink amount, media type, ink order , and dry time can all influence bleed performance.

Resolution

1. Verify the correct media and media profiles are being used. If new media is being used, consider creating a new profile for the media set.
- If not resolved contact Customer Service and report error code GE04-02: Bleed unresolved.

GE05: Scrambled Print

GE05 displays as scrambled or garbled print spanning a zone width equal to one die chip (20 mm)



Picture of Scrambled Print

This defect generally results from a poor connection between printhead and printer. Alternatively, it can arise from cracked dies or broken bond wires.

Resolution

1. Power down the printhead. Re-install the printhead.
If not resolved, continue to the next step.
2. Inspect and clean the printhead and printer contacts.
If not resolved, continue to the next step.
3. Inspect printer connection pins (bent, missing, out of place). If not resolved, continue to the next step.
4. Check alignment between the printer pins and the printhead pins.



If not resolved, as a last resort, switch printhead to see if the defect follows the printhead or is still present on the printer. If the defect is in the printhead, install a new printhead and report error code GE05-05: Scrambled print unresolved.

GE06: Print Skew

GE06 presents as an untended skewing of the body of print. I.e., the print is crooked on the page.

Cause

This defect results from various issues of paper path handling.

Resolution

1. Remove any paper jam.



If not resolved, continue to the next step. 2.



Check the media feeder.

If not resolved, continue to the next step. 3.



Check the paper path sensors.

If not resolved, continue to the next step.

4. Check whether the media being used is too slippery or too heavy.

5. If not resolved, contact Customer Service and report error code GE06-04: Print skew unresolved.

Paper Handling (PA)

Issues with paper handling (PA) cause a range of defects, as detailed in the following sections.

Page Marking from Paper Handling

Page Marking from Paper Handling displays as smudged ink.

Cause

This defect results when the top of the media makes contact shortly after printing.

Resolution

1. Print a solid area fill plot (insert plot name) and confirm area of contact.
2. Check the area of contact on the upper clamshell features to verify that nothing is hanging down that can contact media.
3. Verify that the media entering the print engine is flat and undamaged.
4. Verify that the media is not skewed when entering printer.
5. Verify that the platen in the maintenance module platen is free to move up fully in its guides to the datum from the printhead.
6. Confirm that the printhead is properly seated.

PA01: Printhead Strikes

PA01: Printhead strikes commonly appear as visible smudging on the paper. These are due to the printhead striking the paper as it passes underneath. If the printhead is dirty, then ink transfers to the paper.

Cause

Some common causes of this defect are: media bent or curled prior to entering the printer; pinch rollers not free to move or starwheels missing; obstruction or debris in paper path; platen in maintenance module not properly seated.

Resolution

1. If it is determined that the media is damaged prior to entering the printer, then the damaged media needs to be removed and discarded.
2. Check that the feeder is properly adjusted to prevent media damage.
3. Check for foreign objects in the printer that can cause the media to strike the printhead or cause a pinch roller to stop functioning.
4. Ensure that no starwheels are missing. Replace, if required.

PA02: Feeder Marks

PA02 displays as tracks on the paper that correspond to the measurements of the sheet feeder's wheels (2 x 1/2" wide, roughly 5 in apart).

Cause

This defect results from a dirty feeder assembly, possibly from aerosol or an ink spill that contacts media.

Resolution

The media feeders should be cleaned periodically by vacuuming the dust. Also use a soft lintfree cloth and some dionized water to clean the rollers of the feeder.

PA03: Starwheel Marks

PA03 presents as small track marks that are visible in printed media. The printer has little pointy wheels in the upper clamshell that hold the paper down in the paper path. Starwheel marks are usually only visible on glossy media.

Cause

This defect results when starwheels are exerting too much pressure on paper, are dirty, or are not moving properly.

Resolution

1. Print a solid area fill plot (insert plot here) and look for track marks.
2. Check that all starwheels are present and free to move both rotationally as well as vertically.
3. Vertical force should be the same on all the starwheels ~10g per.
4. Starwheel points should be sharp and not rounded.
5. Clean the starwheels with water and a soft lint-free cloth to get rid of any ink debris on the wheels. Continue process until marks on media have stopped.

Paper Feed Inconsistency

In general this relates to periodic or random horizontal bands in the printed image.

PA04: High Frequency Horizontal Banding

PA04 displays as horizontal banding at a frequency higher than one cycle per 1/2 inch, typically about 1mm spacing. The banding occurs all the way down the page, with a period of 1 cm or less and appears as dark or light horizontal bands across the media. Usually spans the entire width of the media but can vary in degrees of severity across the page.

Cause

Causes may include: debris on paper path rollers, shafts, pulleys, idlers or belt; belt damage, location and tension; loose pulleys and or idlers; loose motor; any interference or touching of the drive system. Also can be due to non-round or non-centered paper drive components. Causes can be identified by the location and spacing between banding. A single defect on the encoder wheel would lead to a horizontal bar about every inch, and can happen as a result of paper fibers landing on the encoder wheel. Higher frequency

banding (less than an inch between lines) can be caused by other noise or imperfections in the paper path.

Resolution

1. Print a solid area fill plot (insert plot here) and measure spacing.
2. Reset belt tension and rerun diagnostic 1040 plot. Check pulleys and bearings for any slop or run-out.
3. Clean rollers and other paper handling mechanisms, adjust belt tightness and ensure that the motor is mounted securely. If tuning the system does not solve the problem, drive components may need to be replaced.

PA05: Top of Form Transition Error (TOFTE)

PA05 displays as a set of horizontal lines visible near the top of the page.

Cause

TOFTE results from a change in paper speed as it transitions to the starwheel feeder after the print zone. If the transition is not smooth, it will result in the horizontal lines. The problem can be exacerbated by thick or curved media and can be improved by reducing the starwheel force, staggering the starwheels and improving the dive angle of the media as it enters the pinch. Any problem with the starwheels sticking, jamming, or being out of position starwheels.

Resolution

Ensure that all of the starwheels are spinning easily and that the spring force is correct. Use thinner media, and ensure that the media is curved so that it transitions smoothly into the star wheel pick area. For labels, use media that does not have the ladder removed.

PA06: Bottom of Form Transition Error (BOFTE)

PA06 displays as a set of horizontal lines visible near the bottom of the page. This occurs 20mm from the bottom of the page.

Cause

BOFTE results from a change in paper speed when the paper is released from the grit shaft that precedes the print area. Differences in speed between the leading and trailing paper handling drives can make the problem worse, as can improper tension settings on the belts and pinch wheels. The paper thickness and shape also plays a role.

Resolution

Ensure that all belts are properly tensioned. SEE TOFTE

Paper Jams and Head Crashes

PA09: True Paper Jams

The sound of crinkling paper usually precedes the notification of a paper jam, PA09. Paper must be cleared to continue printing.

Cause

Causes include debris or objects in the paper path; platen out of position; bent or curled media prior to entering the printer; repeated paper jams are often caused by small pieces of paper that are left behind from a first sheet that ripped.

Resolution

1. Open clamshell and remove jammed media from the paper path.
2. Check for small pieces of paper that may be caught in pinch rollers and other tight places. These small pieces need to be removed before continuing printing.

PA10: False Paper Jams

An error message (for example, "Media present in paper path") claims that there is a paper jam but there is not. In this condition, the cap will be unable to cap the printhead. The maintenance module is also be unable to wipe the printhead as the print engine is set as though media is blocking its path.

Cause

Causes of false paper jams include faulty sensor wiring, or PCA, and debris blocking sensor.

Resolution

1. First, open the clamshell and check for any small pieces of debris that may be blocking the entry or exit sensor causing this error.
2. If determined that no foreign object is blocking the sensor, use TCL commands or scripts to determine if the sensor is functioning.
 -  Query sensor state. (1 or 0)
 -  Using a piece of media or some other object, block or cover the sensor and query again to see if the state has changed. (1 or 0)
3. Check for voltage at sensor and leaving MPCA.
4. Check continuity of wiring from MPCA to sensor end of cable.

PA11: Wrinkled Paper

Paper does not come out flat but also does not jam. Any folding, marking or ripping on the output media.

Cause

Damaged or incompatible media; misadjusted feeder; object in paper path.

Resolution

1. Adjust feeder so as not to cause damage to media.
2. Check to ensure that proper media is being used.

3. Open clamshell; check for and remove any foreign objects in paper path causing the problem.

Margin Defects

Margin defects may appear in the top margin, in the bottom margin, or with the image askew on the page.

PA12: Incorrect Top Margin

The top margin appears very large or very small or nonexistent as the printed image can run off the edge of the media

Cause

Paper path scaling incorrect (NVM setting). Media slip, likely resulting from too light a spring force or excessively high back tension.

Resolution

1. Check the feed mechanism for proper operation.
2. Read the NVM settings to check that PP_scaling is set to 0.
3. Open clamshell and check for any damaged or non-functional pinch rollers.

PA13: Incorrect Bottom Margin

The bottom margin will appear very large or very small or nonexistent as the printed image can run off the edge of the media.

Cause

Paper path scaling incorrect (NVM setting). Media slip, likely resulting from too light a spring force or excessively high back tension.

Resolution

1. Check the feed mechanism for proper operation.
2. Read the NVM settings to check that PP_scaling is set to 0.
3. Open clamshell and check for any damaged or nonfunctional pinch rollers.

PA14: Print Image Skewed

Printed image appears crooked or skewed when viewed in comparison to the edge of the media. Printed image might also run off of the edge of the media on one side and leave white space on the opposite edge.

Cause

This defects results from incorrect feeder alignment and from damaged, dirty, or broken pinch rollers.

Resolution

1. Check that the feeder alignment is straight and of proper height.
2. Open the clamshell and look for any damaged or non-functional pinch rollers.
3. The input system should have paper guides to prevent media from skewing when it is picked.

Ink Delivery System (ID)

For issues with missing or non-recognized ink cartridges, a standard good practice is to remove all ink cartridges, then insert them one at a time and run the “qa” command. In this way, the actual cartridge can be identified, instead of the confusion that may result with bus contention or an incorrectly chipped cartridge. If two identically chipped cartridges are inserted (for example, chips indicate two magentas), one will show as authentic, but the incorrectly chipped cartridge will show up as missing.

ID01: Ink Cartridge Not Recognized When Inserted

The message “ink tank missing” appears on the screen. Querying the QA status may reveal that the cartridge is not authenticated or missing.

Cause

Tanks may not be making contact with the pads that read the chip. This happens if the tank is not inserted fully, the pads on the printer are damaged, or the chip is not located properly on the tank. Chips can also be faulty and fail to read even when the contact is good.

Resolution

Shim bottom of tank to make contact.

1. If the tank is now seen as present, then the contacts on the printer PCA may be damaged.
2. If the tank is still reading as missing, then the chip on the ink cartridge is nonoperational. It is possible for a chip on the tank to be working normally and then not work properly. Try replacing with a different ink cartridge.

ID02: Ink Reported As Out When Not Out (Excess Stranded Ink)

The printer reports empty ink and refuses to print, but the cartridge still has more than 7CCs remaining.

Cause

The primary cause of excess stranded ink is false early detection from the ink low sensor. See “Ink Low When Not Low” for details. There are firmware settings to adjust the allowable ink that can be used after detection. This is currently set to zero as of 10/21/2010. On average, an additional 2CC can be used, but the distribution is not well controlled, and using a nonzero number will not completely protect the user from running out of ink while printing.

This could damage the head, so it is avoided at the expense of excess stranded ink.

Resolution

1. See Low Ink When Not Low. CMs have two avenues to adjust what happens between ink low detection and ink out protection. First, the nvm flag can be set to false so that the printer will only warn about ink out but will not error and prevent printing. Second, the allowable ink after low ink detection can be set to a nonzero number, which will enable most users to print a few more CCs of ink but expose some users to the risk of dry-firing the head.

ID03: Ink Low Indicator When Not Actually Low

The printer reports empty ink and refuses to print, but the cartridge still has more than 7CCs remaining.

Cause

In order to trigger low ink, the low ink sensor must detect low ink in the prism of the cartridge. The sensor can return false readings as a result of electrical noise, improper cartridge placement or printer tilt. The firmware is designed to ignore readings that appear to be due to any of these causes.

Resolution

See Low Ink When Not Low. CMs have two avenues to adjust what happens between ink low detection and ink out protection. First, the nvm flag) can be set to FALSE so that the printer will only warn about ink out but will not error and prevent printing. Second, the allowable ink after low ink detection can be set to a nonzero number, which will enable most users to print a few more CCs of ink, but expose some users to the risk of dry-firing the head.

ID04: Ink Indicated As Out Without Warning

Out of Ink often appears as light printing in a color, all the way across the page, fading from full color to no printing at all within a few pages. Less often, the problem can manifest as a deprime, which shows up as which streak that expands to cover the whole head, often leaving "jellyfish" patterns on the page.

Cause

A sensor can fail to detect Out of Ink if the sensor is coated with sludge or the cartridge is not properly inserted, or the sensor is broken. The light printing is caused by excess backpressure. When there is no ink, the backpressure gets more negative and the drops get smaller. When the backpressure gets to -900 mm H₂O, the printhead is no longer able to eject drops and printing of that color will stop. Waiting a short time will allow some ink to flow across the filter, and a small amount of printing will be possible again. Deprimes that start as a white streak and grow to cover the whole page are more often caused by air injection than excess backpressure, but pumping rapidly when the ink is low can pull air through the nozzles and result in a deprime.

Resolution

1. Test with a full and truly empty tank to ensure that the sensor is working.
2. Replace the ink cartridge with a full tank to confirm that the printer recovers.

ID05: Ink Coming Out of the Printer

Ink drools or puddles on the surface that the printer is sitting on.

Cause

This can happen if the printer is tilted or the clamshell left open with the valves open, or if the printhead is pulled off without depriming. This can also happen if firmware commands are run to abuse the system. (E.g., spitting more than 10CC into the cap, without lowering it to drain.) The ink could be coming from the maintenance module, ink tank, fitting, tubing, printhead or diaper. The likeliest cause is an over-full maintenance module.

Resolution

1. Remove the maintenance module and evaluate whether it was the cause.
2. Dismantle the printer to locate the source of ink.

Paper Cutting (PC)

Issues with paper cutting (PC) cause a range of defects, as detailed in the following sections.

PC01: Cutter Not Operating

Cutter is not moving when commanded, thus stalling the print job and errors out.

Cause

This defect may also result when the cutter is not at home or has an obstruction. Other causes include faulty sensor, wiring, PCA, driver, or motor. A common cause is that the cutter connection is not plugged in, which may be difficult to see in an integrated print engine.

Resolution

Check that the cutter is connected. Try the "cutter home" command followed by a "cutter cut" command. Use "cutter stats" command to determine the state of the sensors.

PC02: Partial or Incomplete Cut

Cutter stops after a partial or incomplete cut. Home sensors will not be made and the other 2 non home sensors will not be made.

Cause

Causes include obstruction. Faulty sensor, wiring, PCA, driver or motor.

Resolution

1. Try the "cutter home" command followed by a "cutter cut" command.
2. Use "cutter stats" command to determine the state of the sensors.

Firmware Error Messages (ER)

Error messages (ER) may display on the Toolbox, indicating a problem. The following sections detail some of the more common messages.

ER01: PEP Data Underrun

The paper path motion stops under this condition. Partially printed pages are common as the error only occurs while the paper path is moving. This condition can be temporarily reset by pressing the reset button on the PPCA or by rebooting the printer. ER01 can be very intermittent in nature.

Cause

Several causes might be behind this issue:



A dirty encoder due to paper fibers.

A damaged encoder, cable, or board component.

A bad motor or driver; belt tension too high or low, excessive drive train friction (belt, pulleys, idlers, shafts, bearings.) Can be caused by a dirty sensor or servo issues.

Resolution

1. If the encoder is working then check belt tightness.
2. If the problem is not resolved, contact Customer Service and report ER01-03.

ER02: Servo Error Limit Exceeded

ER02 indicates that a servo motor requires more power than is specified in the firmware code.

Cause

This defect results from any impedance to mechanical motion. Alternatively, the electric motors may have reached life.

Resolution

Contact Customer Service for assistance.

ER03: Tilt Error

In order to protect from situations that could cause ink mixing and possible spillage, the printer will not function if it is tilted. The print engine needs to be operated on a completely level surface for proper operation.

Cause

Tilt sensors can give bad readings when there is excess electrical noise or EMF in the vicinity, or if the table on which the printer is sitting is vibrating.

Resolution

1. Confirm that the printer is level and keep printer on sturdy table, away from excess physical vibration and electrical interference.
2. If problem persists, recalibrate (see TCL help for re-calibration): *TCL › accel_zero* (for proper restart, use: *TCL › shutdown*).

WARNING – The print engine must be level when you re-calibrate or else the tilt protection system will not work and the printer will suffer from severe ink mixing.

ER04: SS Lift Error

In order to protect from situations that could cause ink mixing and possible spillage, the printer will not function if it is tilted.

Cause

Tilt sensors can give bad readings when there is excess electrical noise or EMF in the vicinity, or if the table on which the print engine sits is vibrating.

Resolution

1. Level the printer and keep printer on sturdy table, away from excess physical vibration and electrical interference.
2. If problem persists, re-calibrate (see TCL help for re-calibration).

WARNING – The print engine must be level when you re-calibrate or else the tilt protection system will not work and the printer will suffer from severe ink mixing.

ER05: PrintZone

Some object is blocking one of the paper path sensors located at either the entrance or exit of the printer. Will stop printing and may inhibit some of the maintenance functionality.

Cause

Remove media blocking sensors.

Resolution

1. Open the clamshell and remove the debris or media.
2. Reset mech on top left button.

ER06: Paper Path Timeout

Paper path motion stops due to no media present at entrance of printer within the set limits after a print job has started.

Cause

Various, including media jam or media otherwise not feeding properly

Resolution

Use the reset button.

ER07: Cutter Failure

The cutter can fail if it loses track of its position.

Cause

Not being homed.

Resolution

Re-home the cutter using *TCL › cutter home*.

Maintenance Module (MM)

Issues with the maintenance module (MM) cause a range of defects, as detailed in the following sections. The maintenance module is also known as the service station (SS) in some contexts and messages.

MM01: Wiper Not Spinning

The wiper roller is not spinning. No sound of the wiper motor is heard. Other maintenance functions may also be affected.

Cause

The temperature is too high, the FW safety cable unplugged; a bad motor, cable, PCA, or driver. An obstruction is in drive train. The drive train is loose, misaligned, or broken.

Resolution

1. First, disable the clamshell sensor by sending a *TCL> nvm_getset*.
2. Send a wipe command while the clamshell is open. Check that the wiper is installed correctly and the retention clips are properly locked into place. If the problem continues, you may need a new maintenance module.
3. Printer firmware estimated motor temperature and shuts off the motor if it is believed to be too high. Waiting a few minutes should resolve this issue.
4. Maintenance module wiper assembly could be removed and turned by hand to determine if it is physically able to rotate and not jammed up.
5. If it is jammed up, replace the maintenance module.
 If not jammed, further troubleshooting is required to determine if problem is the motor, cable, or PCA. See also the sections on servo, encoder and sensor failure.

MM02: Maintenance Module Is Not Going Home

The maintenance module is not homing, and may or may not be making noises when trying to home. Printing and maintenance functions disabled as the MM will not be able find other locations.

Cause

Send a home command while the clamshell is open. Bad sensor, cable or PCA. Obstruction in sensor or in path of sled. Faulty stepper, cable, PCA, pulley or gear, misaligned sled.

Resolution

Eject the sled and then reinstall. Be sure to make sure that the sled is not skewed when installing; send a home command while the clamshell is open and check that the station can home correctly.

If the issues continues, contact your application engineer for additional assistance. Using TCL, query the sensor to get the state. Block or cover the sensor and query again to see if state changed. Check continuity of cable, check voltage at sensor and MPCA.

7. Printer Specifications

Printer Technology

Drop on Demand Thermal Inkjet printing
Printable width is 215.9 mm (8.5 inch)
70,400 nozzles (14,080 per color)
Five channels: Cyan, Magenta, Yellow, Black (2x)

Print Speed

300mm/s at 1,600 x 1,600 dpi black
300mm/s at 1,600 x 800 dpi color
150mm/s at 1,600 x 1,600 dpi black and color
12 inches/s (21,6 km/day)

Print Quality

Black and color: 1,600 dpi native resolution

Operating Systems

Microsoft Windows XP and Windows 7 and Windows 8

Media Formats

Roll Media, Fan Fold Media
8.75" wide perforated, 500 6" fan-fold

Media Handling

Gap sensing
Black mark sensing
Continuous roll handling

Media Dimensions

Max media width: 215,9mm (8,5 inch)
Minimum media width: 50mm (2 inch)
Minimum media length: 91.5mm (3.6 inch)
Media thickness: 0.13 to 0.33mm (.007-0.13 inch)

Power Interface

20 AMPS @ 24VDC
(Maximum current power supply load)

Ink Cartridges

Dye based inks, colors: CMYKK
Non-refillable ink cartridges
Cartridge size: 250ml

Cutter

Integrated cutter

Operation data

Power supply	90-240 V ~50/60 Hz, PFC
Power consumption	max. 1200 W (5A bizt.)
Operating temperature	15-35 C°
Humidity	40% range

Dimensions

Width	61 cm
Height	40 cm
Depth	40.5 cm
Weight	40 kg

Print speed quick chart

The table below shows the print performance of the printer expressed in printing length and label count for given print time intervals. This information is for getting a feel of the volume the printer can print for planning purposes.

	Speed (IPS – Inch per second)							
	6	12	6	12	6	12	6	12
	Printed length				Number of labels		Number of 150 m rolls	
Printing time	(inch)	(inch)	(m)	(m)	4x6	4x6		
1 sec	6	12	0.2	0.3	1.5	3	0	0
30 sec	180	360	4.6	9.1	45	90	0	0
1 min	360	720	9.1	18.3	90	180	0.1	0.1
10 min	3,600	7,200	91.4	182.9	900	1,800	0.6	1.2
30 min	10,800	21,600	274.3	548.6	2,700	5,400	1.8	3.7
1 hours	21,600	43,200	549	1,097	5,400	10,800	4	7
8 hours	172,800	345,600	4,389	8,778	43,200	86,400	29	59
24 hours	518,400	1,036,800	13,167	26,335	129,600	259,200	88	176
5x8 hours	864,000	1,728,000	21,946	43,891	216,000	432,000	146	293
24/7 operation week	3,628,800	7,257,600	92,172	184,343	907,200	1,814,400	614	1,229
Time to print a 150 m roll (min.)	16.4	8.2						